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ENDOCARDIAL FIBROSIS SIMULATING CONSTRICTIVE PERICARDITIS*

Report of a Case with Determinations of Pressure in the Right Side of the Heart and Eosinophilia

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THE first physician to describe the association of endocardial fibrosis and eosinophilia as a clinical entity was Löffler[1] in 1936. The similarity of this disease to constrictive pericarditis was noted, and it was postulated that in both entities the clinical picture results from restriction of diastolic filling by a thick fibrous plate; it makes little difference whether the thickened plate consists of pericardium or endocardium.

Löffler considered the entity that he described to be a manifestation of the rheumatic state, as did Mumme[2] and Berblinger,[3] who have reported cases in which there was thought to be "rheumatic involvement of valve leaflets." Berblinger[3] reviewed the literature in 1948, and found only 10 cases of this entity. Bedford and Konstan,[4] however, had pointed out in 1946 that a similar condition is a common cause of death in Africa. Since that time, several authors[5-7] have described series of cases occurring in Africans, or in Europeans living in Africa, in which the clinical course was characterized by relentlessly progressive, unexplained congestive heart failure, sometimes associated with eosinophilia. Histologic examination of the heart in these cases showed necrosis of the myocardium and endocardium, together with marked endocardial thickening.

Becker, Chatgidakis and van Lingen[5] reported a series of 40 cases from South Africa in which eosinophilia was not a prominent feature. These authors conducted histochemical analyses, which gave evidence interpreted as supporting the concept that this entity should be classified as a "diffuse collagen disease."

A review of the American literature has revealed only 1 description of endocardial fibrosis associated with eosinophilia.[8] However, the recent report of Thomas and his associates[9] has suggested that the fetal type of subendocardial fibroelastosis may occasionally persist in the adult. These authors presented 20 cases from the files of the Massachusetts General Hospital in which the clinical course was similar to that of the disease as described in Africa but in which there was no eosinophilia and no necrosis of the subendocardial fibroelastic tissue.

Although fibrosis of the endocardium may be caused by a variety of pathologic processes, each results in restriction of diastolic filling, and as Löffler[1] has pointed out, the clinical manifestations do not differ significantly from those of constrictive pericarditis.

The following case is considered to be of interest because of the unusual opportunity for long-term observation of the patient, and because of the availability of physiologic data obtained by cardiac catheterization.

CASE REPORT

A 35-year-old truck driver first entered a Veterans Administration hospital in May, 1948. At that time he complained of nausea, vomiting, abdominal cramps and severe weakness, all of 24 hours' duration. He stated that 1 week before the onset of his symptoms, he had been treated by his physician for an abscess on the right foot.

He had served in the Army for 4 years, during which he had been stationed in the South Pacific. He had suffered from recurrent malaria, but otherwise had been perfectly healthy before the present illness.

Physical examination revealed a well developed, well nourished man, who appeared pale and acutely ill. Examination of the chest, heart and abdomen showed no abnormality.

The temperature was 101°F., the pulse 90, and the respirations 22. The blood pressure was 100/75.

Urinalysis was negative. Examination of the blood showed a red-cell count of 4,830,000 and a white-cell count of 16,8000, with 83 per cent neutrophils and 17 per cent lymphocytes. The sedimentation rate was 25 mm. in 1 hour. The blood Kahn test was negative. Several stool and blood cultures yielded no growth of pathogenic organisms.

After the 1st few days in the hospital the nausea and vomiting ceased, but the weakness, fever and leukocytosis

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remained. Agglutination tests for brucellosis, typhoid fever and tularemia were negative, as were skin tests for tuberculosis and trichinosis. Examination of biopsies of skin, muscle and a small axillary node yielded no diagnostic information.

During the 3d week of illness an eosinophil count of 56 per cent was demonstrated, and throughout the 1st period of hospitalization (lasting for 6 months) the white-cell count ranged between 18,000 and 33,000, and the differential count showed eosinophils varying between 55 and

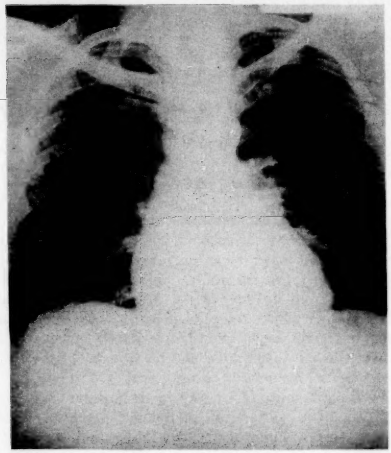

FIGURE 1. *Posteroanterior View of the Chest, Showing Slight Cardiac Enlargement.*

65 per cent. The red-cell count and sedimentation rate remained within normal limits.

After 1 month in the hospital, the patient complained of vague joint pains and severe weakness. The pulse rate increased to 100, and the temperature rose each afternoon, occasionally as high as 102°F.

During the 3d month, mild dyspnea and minimal ankle edema were noted. The pulse rate had risen to 124, and the blood pressure was 90/75. At this time a Grade 3 blowing systolic murmur was heard along the left sternal border. Two weeks later, the patient awoke at 2 a.m. suffering from an episode of dyspnea, coughing and severe orthopnea. Examination revealed an enlarged, pulsating liver, with physical signs of abdominal fluid. He was digitalized and salt was restricted, and for a while, he felt better. However, the pulse remained weak and irregular; the pulse pressure was narrow, and the liver remained enlarged.

During the next 3 years, the patient was allowed to be home for short periods but repeatedly returned to the hospital because of relentlessly progressive congestive heart failure, which did not respond to the usual cardiac medications. After the 1st year of observation, the low-grade fever and eosinophilia disappeared.

In June, 1951, on readmission to the hospital physical examination disclosed an extremely weak, emaciated man, who was dyspneic at rest, orthopneic and jaundiced. His face was "pinched" in appearance, and his lips were slightly cyanotic. There was evidence of marked jugular pulsation. Examination of the chest gave evidence of bilateral hydrothorax. The heart was slightly enlarged to percussion. Heart sounds were faint. Rhythm was irregularly irregular. One observer noted a "protodiastolic murmur." The pulse could not be palpated during inspiration. The liver was enlarged, smooth and tender, and pulsated. The venous pressure was equivalent to 300 mm. of saline solution.

The pulse was 120, and the blood pressure 100/80.

Exploratory thoracotomy was performed on June 25 by Dr. Robert K. Brown, with a presumptive diagnosis of constrictive pericarditis. There was a minimal amount of pericardial fluid, and no evidence of pericarditis.

There was a short period of clinical improvement after operation, but the course soon reverted to one of relentlessly increasing right-sided heart failure. Despite attempts to control the ascites with exchange resins, weekly paracentesis was required. During the last week of life, the patient became comatose, and he died on January 15, 1952.

X-ray examination during the 1st 2 years in the hospital showed no striking abnormality. During the last year of observation, the heart demonstrated generalized chamber enlargement (Fig. 1).

Serial electrocardiograms indicated atrial fibrillation and nonspecific T-wave changes (Fig. 2). Dr. Myron Prinzmetal, who reviewed these tracings, pointed out that although there was extensive fibrosis of the subendocardium, the electrocardiogram showed normal QRS complexes. This finding tended to support Dr. Prinzmetal's opinion that the subendocardium is electrocardiographically "silent."

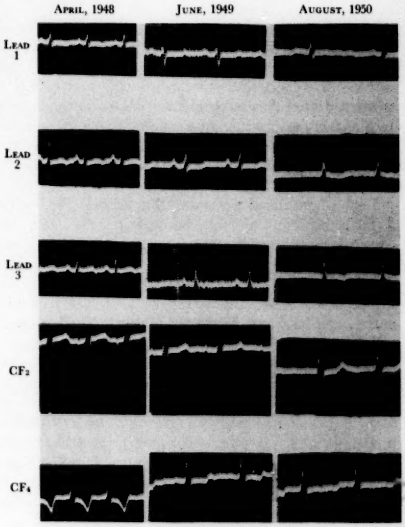

FIGURE 2. *Serial Electrocardiograms.*

The pressure tracing from the right atrium revealed a plateau throughout most of the cardiac cycle with a level of 32 mm. of mercury (Fig. 3). There was but a single downward deflection during the cardiac cycle, and this occurred at the time of the opening of the tricuspid valve, coinciding exactly with the early diastolic dip of the pressure contour of the right ventricle. The pressure level at the nadir of the dip was 27 mm. of mercury. The tracing from the right ventricle was strikingly abnormal (Fig. 4). The systolic pressure was but slightly elevated, being 39 mm. of mercury. There was an early diastolic dip to a level of 27 mm., followed by an abrupt rise to a high diastolic plateau of 32 mm. The pressure contour and levels during diastole were identical in the atrium and ventricle. The systolic pressure within the pulmonary artery was only slightly elevated, and the contour revealed a low pulse pressure. The pulmonary-artery pressure was 35/30 mm.

of mercury. This could be accounted for entirely on the basis of the elevation of the pressure in the left atrium. The mean "pulmonary capillary" pressure, a reflection of the pressure in the left atrium, was 25 mm. of mercury. Thus, there was no increase in the gradient of pressure from the pulmonary artery to the left atrium. The ratio of end-diastolic to systolic pressure in the right ventricle was markedly elevated, being 2:3.

Except for chronic passive congestion of the liver, spleen, and kidneys, the significant findings at autopsy were confined to the heart, which weighed 470 gm. There were numerous areas of roughening of the epicardial surface (probably caused by recent pericardotomy since the coronary vessels were patent and showed no abnormality). The endocardium was grayish white and fibrous, and measured up to 8 mm. in thickness. It composed nearly half the wall of each ventricle. The papillary muscles were bound down and shrunken into the dense, fibrous endocardium (Fig. 5). The tricuspid valve was normal, measuring 12 cm. in circumference, and the chordae tendineae were

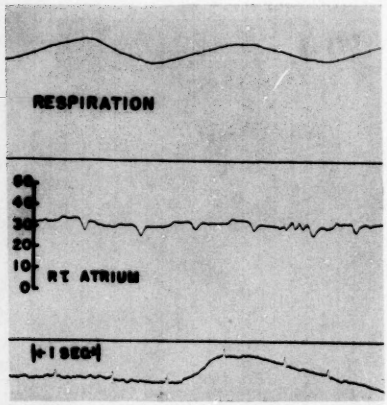

FIGURE 3. *Tracing of Pressure from Right Atrium.*

shortened. The pulmonic valve was not remarkable. Three centimeters below the pulmonic valve was a firm, fibrous endocardial ring having an orifice of 1.5 cm., and giving the appearance of a constricted "second pulmonic valve" (Fig. 6). The mitral valve showed no abnormality. The aortic valve was thickened, and the lateral and posterior cusps were fused at the commissure, giving the appearance of a bicuspid valve. Organized thrombi were attached to both ventricular walls. No major areas of myocardial fibrosis were visible on gross examination. The proximal aorta and coronary ostia showed no abnormality.

On microscopical examination the endocardium of each ventricle was found to be markedly thickened (Fig. 7). It was composed of roughly parallel bundles of collagen fibers, which in each ventricle merged intimately into well organized mural thrombi. The hyalinized mass contained fibrin and scattered erythrocytes. There were, in some areas, patches of fibroelastosis and, in others, thick bands of collagenous fibrous tissue (Fig. 8), lacking elastic fibers or containing fibers that were fragmented and distorted. Many of the thebesian vessels (Fig. 9) were widely dilated, giving the appearance of varicosities. In numerous sections, subendocardial fibrosis was visible, and areas of fibrosis were scattered throughout the myocardium (Fig. 10). The exact extent of scarring was difficult to estimate. The papillary muscles appeared generally destroyed or replaced by fibrous scarring.

Discussion

Grossly, the degree of endocardial fibrosis in this case appeared equal to, if not more profound than,

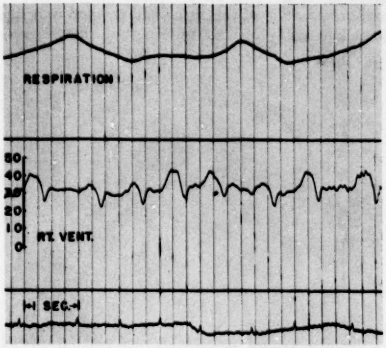

FIGURE 4. *Tracing of Pressure from Right Ventricle.*

that in the previously reported cases, particularly those of Thomas and his co-workers[9] and Davies.[6] The microscopical lesion presented features described by both groups. Although there were patchy areas

FIGURE 5. *Section through the Left Ventricle.*

of fibroelastosis, thick bands of collagenous fibrous tissue, lacking elastic fibers, were even more prominent.

The pathological features, summarized briefly, were those of extensive productive fibrosis of the endocar-

dium, with destruction of endothelium and obliteration of the papillary muscles. The entire inner structure of the heart was replaced by a thick, leathery layer of collagenous fibrous tissue overlaid in many areas by mural thrombi of various ages. Contraction and organization of this tissue had resulted in a rigid, immobile cavity of constant size, and in obstruction

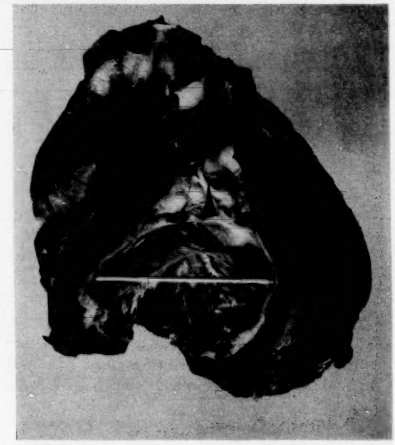

FIGURE 6. *Section through the Right Ventricle.*

of the thebesian veins, which normally would have drained into it. There was also myocardial fibrosis. Occasionally, patches of elastosis suggested that fibroelastosis had been a part of this process.

A review of the histologic changes in previously reported cases indicates that there may be several types of endocardial fibrosis.[5-7,9-13] Josserand and Gallavardin,[10] in 1901, described 2 cases of marked endocardial thickening associated with interstitial myocarditis. One of these patients had tuberculosis, and the authors suggested that the observed changes might be associated with this disease. However, no infectious agent has been conclusively demonstrated to be consistently associated with the development of massive endocardial fibrosis.

Levy and Rousselot[11] reported 3 cases of endocardial fibrosis associated with myocardial hypertrophy together with a peculiar hydropic degeneration of the cardiac muscle fibers. Smith and Furth[12] noted similar findings in 3 patients who gave histories of dietary deficiency. It was suggested that the appearance of the degenerated muscle fibers was similar to that described by Dock[14] in cases of beriberi heart disease. Several of the cases reported from East Africa may also have been associated with vitamin deficiency.[6] However, Gray[7] has presented 2 cases observed in Europeans living in Africa who were known to have had adequate diets. In the case reported above there was neither evidence of a deficient diet nor hydropic degeneration of myocardial fibers.

Löffler[1] and others[2,3] who have studied the entity, in which eosinophilia is a prominent feature, have also noted an association of rheumatic abnormalities. This concept of rheumatic etiology is also supported by the histochemical examinations of Becker and his co-workers.[5] The aortic valve was thickened in the case presented above, but there was no microscopical evidence that the lesion was rheumatic in origin.

The report of Thomas and his co-workers[9] indicates that fetal fibroelastosis may occasionally persist in the adult. These authors compared their own autopsy material with that of some of the cases reported from

FIGURE 7. *Microscopical Section (X21), Showing Marked Endocardial Thickening and Overlying Thrombus.*

Africa and stated that the two groups of cases represented different entities, in that the African cases showed marked necrosis of the endocardium whereas their own cases showed primarily fibroelastic proliferation. The case reported above was peculiar in that the endocardium contained areas similar to those described by each group.

Of the cases previously reported, the case presented above most resembles those of Löffler[1] and Gray.[7] However, we can add little to the knowledge concerning the obscure etiology of this condition, except to

emphasize previous observations that endocardial fibrosis may occur with several histologic patterns.

The similarity between the clinical findings in restrictive endocarditis and constrictive pericarditis is emphasized by the fact that in this case, as well as in that presented by McKusick and Cochran,[15] and in Case 14 of those reported from the files of the Massachusetts General Hospital,[9] the patient underwent pericardotomy with a presumptive diagnosis of constrictive pericarditis.

The characteristic features of the pressure tracings in patients with constrictive pericarditis have been thoroughly and adequately described.[16-22] The early diastolic dip in the pressure curve from the right ventricle rapidly followed by an abrupt rise to a high plateau was once considered to be diagnostic of constrictive pericarditis.[23] However, it was soon realized that this contour of the tracing, although characteristic, is not specific. Hansen et al.[17] and, more recently,

FIGURE 8. *Van Gieson Stain (X60), Showing an Area of Fibroelastic Proliferation and Several Other Areas with Fragmentation and Distortion of Elastic Fibrils.*

other observers[20,21,24-26] have pointed out that these features are observed in the pressure tracings of patients with failure of the right ventricle and myocardial fibrosis. McCord and Blount[27] noted similar findings in the pressure tracings of patients with organic tricuspid insufficiency.

Burwell and Robin[25] stated that there are no pathognomonic findings in the pressure tracings from the right atrium and right ventricle in patients with constrictive pericarditis. They described several patients with characteristic clinical findings and pressure curves of constrictive pericarditis. However, on exploration the pericardium was found to be normal, and evidence of myocardial fibrosis was demonstrated.

FIGURE 9. *Section through the Myocardium (X21), Showing Striking Dilatation of the Thebesian Vessels.*

Clinical findings suggestive of constrictive pericarditis have also been described in patients with primary systemic amyloidosis.[28] Hetzel, Wood and Burchell[19] presented pressure tracings from the right side of the heart in a patient with primary systemic amyloidosis revealing the characteristic features of patients with constrictive pericarditis. In this disease the individual muscle fibers are encased by the diffuse deposition of amyloid, producing atrophic and degenerative changes in the muscle fibers.

Although the pulse contours from the right side of the heart in patients with myocardial fibrosis and infiltrates may portray the typical features of the tracings from patients with constrictive pericarditis, they have not, in the available published patterns, demonstrated the marked derangement of the latter.

To our knowledge, no pressure contours from the right side of the heart in patients with marked endocardial fibrosis or restrictive endocarditis have been published. However, both McKusick and Cochran[15] and Burwell and Robin,[25] in discussions of this sub-

ject, have anticipated that when such contours are obtained, they may well reveal the characteristic features of tracings from patients with constrictive pericarditis.

The case presented above reveals the typical clinical findings of constrictive pericarditis, and the pressure patterns obtained from the right side of the heart are also considered to be highly characteristic. However, autopsy disclosed a normal pericardium, slightly patchy fibrosis of the myocardium and marked

FIGURE 10. *Section through the Myocardium, Showing Fibrosis.*

endocardial fibrosis diffusely involving both ventricles. The atria were not involved.

Yu and his associates[21] emphasized the significance of the ratio between the end-diastolic and systolic pressures from the right ventricle and stated that, in their experience, this ratio had not exceeded 1:3 in conditions other than constrictive pericarditis. The ratio in the patient described above was at least 2:3 —a ratio that to our knowledge exceeds that in any published case of constrictive pericarditis.

The pulse contours from the right side of the heart obtained in this patient are also of interest in evaluation of the importance of constriction of the atria in the pressure curves from patients with constrictive pericarditis. Isaacs, Carter and Haller,[29] by experimentally producing and studying localized and generalized pericardial lesions, concluded that constriction of the atria is rarely, if ever, of primary importance in constrictive pericarditis. The hemodynamic changes in this patient were as severe as any observed in constrictive pericarditis; yet the atria were entirely free of involvement, thus supporting the impression obtained from the experiments of these authors.

The elevated capillary pressure, reflecting increased pressure in the left atrium, suggests that the left ventricle was equally involved. This is in accord with the observation at autopsy that the subendocardial fibrosis extended throughout both ventricles.

The basic defect responsible for the altered hemodynamic pattern in this patient was the restriction of the ventricles and was similar in effect to the constriction of the ventricles in patients with constrictive pericarditis. This particular lesion involving the endocardium might be expected also to have affected the myocardium for the same reasons that the thickened pericardium involves the myocardium. The endocardial lesion, however, might well further have affected the myocardium because of the occlusion of the thebesian vessels. The extent of the involvement in this case was demonstrated by the dilatation of these vessels observed in the microscopical sections (Fig. 9). Thus, myocardial fibrosis also contributed to the production of the pathologic physiology—a factor that has been stressed by other authors discussing patients with constrictive pericarditis.[24]

Systolic ejection was impaired, and the stroke volume was decreased in this patient because of the restriction of the greatly thickened endocardium and myocardial fibrosis. The endocardial involvement also prevented diastolic relaxation of the ventricles, and greatly impeded diastolic filling. The decrease in cardiac output and the impairment of diastolic filling were responsible for the pathologic physiology in this patient with subendocardial fibrosis. It is considered that any process preventing diastolic relaxation of the ventricles and resulting in marked impairment of systolic ejection, thus decreasing cardiac output, will produce characteristic pressure patterns in the right atrium and ventricle. It is also apparent that such findings occur regardless of whether the primary defect involves the pericardium, the myocardium or the endocardium.

SUMMARY AND CONCLUSIONS

A case of endocardial fibrosis with associated eosinophilia is presented, and the pathological features are discussed.

Pressure patterns from the right side of the heart, which are described for the first time in this entity, are similar in all respects to those observed by many authors in patients with constrictive pericarditis. This finding supports the concept that similar pathophysiologic changes result from impairment of systolic ejection and restriction of diastolic filling of the ventricle regardless of whether the primary disease involves the pericardium, the myocardium or the endocardium.

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PREVENTION OF POSTOPERATIVE HEMATOMA BY THE USE OF THE COMPRESSION SUTURE*

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POSTOPERATIVE hematoma, a complication apt to occur in wounds of more mobile areas or in fields requiring the undermining of covering structures, can be minimized by attention to the all-important factors of hemostasis and the elimination of dead space. The latter can be controlled in most cases by the observation of well tried principles; layer-to-layer closure; imbrication of layers; filling of dead space by rotated muscle or skin-fat flaps from adjacent borders; introduction of space-filling materials such as bone, cartilage and inorganic substances; and use of pressure dressings combined with immobilization.

Occasionally, however, one encounters situations in which conventional methods of closure and dressing fail. The problem usually involves a search for some way in which the covering integument, composed of either the sutured margins of the operative wound or a flap of skin and subcutaneous tissue advanced or rotated into the wound, can be made to adhere effectively to the floor of a concave defect. To solve this problem a type of dressing termed the compression suture has been employed for several years; this technic is applicable in any anatomic region where one finds two parallel epithelial surfaces such as the hand, ear, cheek, lips, anterior wall of axilla or scrotum. It consists of a mattress suture of silk, incorporating a large button in its loop, carried on

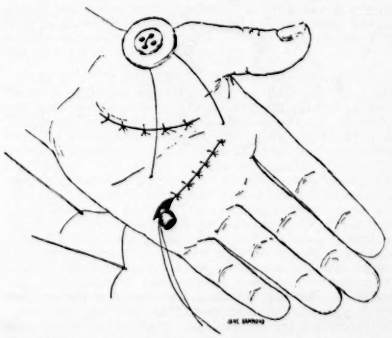

FIGURE 1. *Drawing, Showing the Compression Suture in Position in Case 1.*

*Presented at the annual meeting of the New England Surgical Society, Bretton Woods, New Hampshire, September 16, 1955.

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straight needles through the covering integument and through the base of the wound, emerging from the opposite epithelial surface and being tied, after careful packing of the depression with fluffed gauze, over a second button to bring pressure to bear on the

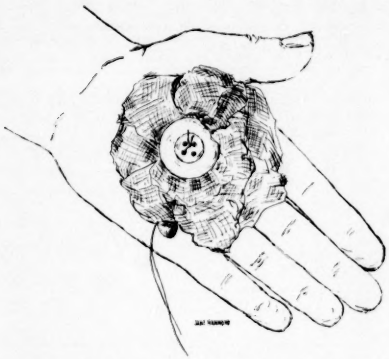

FIGURE 2. *Drawing, Showing the Closed Incision, with Drain and Gauze in Place (Case 1).*

central portion of the concavity, where hematoma is apt to start. Several cases are reported to demonstrate its use.

PREVENTION OF DUPUYTREN'S CONTRACTURE

CASE 1. A 54-year-old janitor presented the typical plaques and bands of Dupuytren's contracture involving

FIGURE 3. *Drawing, Showing Completion of Suture, with Compression (Case 1).*

the ring and little fingers of the right hand in addition to minor dimpling of the left palm.

The usual treatment, consisting of radical resection of the palmar aponeurosis, creates in the palm a pocket in which hematoma is likely to develop. The conventional elastic-bandage dressing tends to narrow the carpal arch and deepen the palmar cup, making the pooling of blood more probable.

To prevent this untoward event the following technic was employed. Through a double palmar incision (Fig. 1) the palmar aponeurosis, including the intertendinous slips, was completely excised, and the proximal incision sutured. Before the distal incision was closed, a compression suture of No. 000 silk, double armed on straight needles and incorporating a button in its loop, was passed under direct vision through the palmar skin and through the 2d and 4th intermetacarpal spaces, avoiding the neurovascular bundles that could be visualized but staying far enough distalward to avoid the motor branch of the ulnar nerve. The last incision was then closed, a small drain brought out through the ulnar angle, and fluffed gauze packed in and around the silk loop (Fig. 2). The suture was passed through a 2d button on the dorsum of the hand, packed and tied to afford snug pressure in the cup of the palm (Fig. 3). The entire hand was then enclosed in a conventional fluffed-gauze dressing retained by means of an elastic bandage, immobilizing the hand in a position of func-

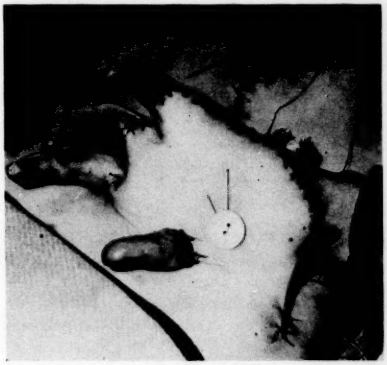

FIGURE 4. *Application of an Abdominal Pedicle Flap to the Palm (Case 2).*

tion. One week later the dressing was removed, revealing a reasonably soft palm, with maintenance of its central concavity.

During the past five years this method has been used in 22 consecutive cases. In only 1 of these has a hematoma been demonstrated — a case in which the compression suture was introduced through the second and third, rather than the second and fourth, intermetacarpal spaces. A small localized collection of blood occurred on the ulnar side of the compression suture. This is in dramatic contrast to the frequent appearance of boggy edema or frank hematoma in the past.[1]

PEDICLE FLAPS

The compression suture has proved equally satisfactory in the application of pedicled flaps to the hand.[2] Elastic compression on a flap attached to the palm of the hand, if firm enough to prevent hematoma, will almost certainly embarrass circulation at the edge of the flap. The compression suture brings effective pressure to bear on the central area, which

is most susceptible to hematoma formation, without affecting appreciably the peripheral aspects of the skin graft.

CASE 2. An 8-year-old girl was seen 1 month after a wringer injury that denuded the palm of the left hand, avulsed the flexor tendons and ulnar nerve and exposed widely the 3d and 4th metacarpophalangeal joints. The badly damaged little finger had been removed at the time of the initial débridement.

The granulating surface was first covered with a split-thickness skin graft to reduce edema and permit some restoration of joint mobility. Two months later the temporary covering was removed, and an abdominal pedicled graft substituted (Fig. 4). A compression suture was carried through the flap and through the 2d and 3d intermetacarpal spaces (the 3d intermetacarpal space being used in the absence of the 4th), packed in the same manner as described in Case 1 and retained for 8 days. Excellent apposition was maintained in this vulnerable area, with no suggestion of impaired viability in either the central or the peripheral parts of the graft. Insertion of the flap was completed in 3 weeks, and a soft mobile flap obtained, preparing the hand for further reconstructive work.

FIGURE 5. *Elimination of a Hematoma Cavity of the Cheek (Case 3) Three Days Postoperatively, with the Dressing Removed but with the Compression Suture Still in Place.*

PREVENTION OF HEMORRHAGE

The compression suture will prevent bleeding in cases of acute injury or operative trauma about the ears, lips or cheeks in which parallel epithelial surfaces are particularly adaptable to such a method of control.

CASE 3. One week after a severe contusion of the right side of the face, diffuse swelling had resolved itself into a large subcutaneous hematoma just below the malar eminence. After an ineffectual attempt at aspiration, the fluctuant area was exposed through a transverse incision, and 10 ml. of partially clotted blood evacuated, exposing a deep concavity in which fluid was almost certain to reaccumulate. To obviate this event, 2 compression sutures were placed through the superficial wall of the pocket and carried into the mouth through the buccal wall just superior to the course of the parotid duct (Fig. 5). After fluffed gauze had been packed in and about the silk loops, the sutures were tied over buttons lying flush against the superior buccal wall, and the entire side of the face covered by a bulky immobilizing dressing. Three days later the wound was found to be well healed, with the skin cover lying in close approximation to the indented base, creating a visible concavity. Six months later the soft, pliable cheek had resumed its normal contour.

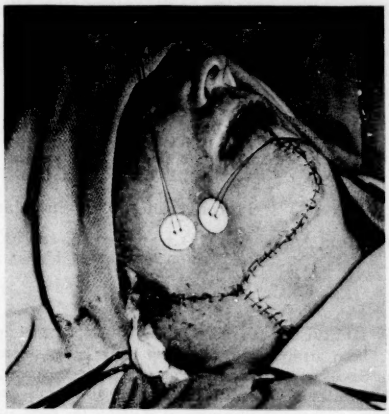

FIGURE 6. *Maintenance of Skin and Mucous Membrane after Resection of a Carcinoma of the Mouth (Case 4), including Resection of the Mandible and Cervical Lymph Nodes.*

CASE 4. A 70-year-old man presented a large, fungating, Grade 2 squamous epithelioma of the right inferior buccal sulcus, extending onto the buccal wall and alveolar process. Treatment included a combined radical neck dissection, resection and disarticulation of most of the right side of the mandible and a resection of the sublingual floor and side of the tongue. The closure of such an operative defect frequently presents a problem in obtaining satisfactory contact between cheek skin and reconstructed mucous-membrane lining. In this case 2 compression sutures were used side by side, carried through the skin and mucous membrane (Fig. 6) and incorporating intraoral buttons, which lay flush against the reconstituted mucosa. Gauze was packed in and around the external loop of the suture before tightening, after which a conventional fluffy-gauze dressing was applied and retained by elastic-bandage compression to immobilize the jaw. On removal of the dressing 5 days after operation, excellent coaptation in this vulnerable area was noted.

DISCUSSION

The compression suture can be utilized wherever two parallel epithelial surfaces present themselves for suitable application. In fact it has been used without

the second button, as in radical dissection of the inguinal nodes; several sutures engage the floor of the operative defect, pass through the overlying skin flaps and are tied over buttons and packing.

The compression-suture technic has a definite advantage over conventional ways of applying pressure to concavities for the purpose of eliminating postoperative hematoma. The usual methods of holding overlying skin in effective contact with the base of a pocket bring so much pressure to bear on the skin covering the lips of the depression that necrosis is a frequent result. The compression suture, on the other hand, directs pressure on a relatively small central area, where hematoma is most likely to occur, leaving the more peripheral areas well vascularized and capable of bringing adequate circulation to the central area, where the pressure effect is being produced.

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BLOOD COAGULATION IN PREGNANCY*

Proconvertin and Prothrombin, and the Hypercoagulable State

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BOSTON

ALTHOUGH thromboembolism has frequently been attributed to abnormal blood coagulation, convincing evidence for this concept has been lacking. The disclosure of hitherto unrecognized coagulation factors and the development of methods for their assay prompted re-examination of this question. Pregnancy was selected as the initial area of study because it constitutes a common, temporary, reversible, physiologic state that is too frequently complicated by thromboembolism. This report presents data indicating that during pregnancy abnormally high levels of at least one important clotting constituent do develop, returning to normal in most cases after term. It is proposed that these changes reflect a state of hypercoagulability that provides a fertile substrate for thromboembolism when combined with any one of several other alterations known to occur in the gravid woman.

Technical Aspects

Studied concurrently were 41 presumably normal, nonpregnant women (average age of twenty-two and range of eighteen to thirty-five years), and 90 pregnant women (average age of twenty-seven and range of eighteen to forty-two) in various stages of pregnancy. The former were selected at random from students, nurses, technicians and other hospital personnel. The gravid women were those with uncomplicated pregnancy who were being followed in the Obstetric Clinic, and who were delivered on the Obstetrical Service, or under the private care of obstetricians, at the Beth Israel Hospital. Subjects were selected irrespective of the number of earlier pregnancies, and no attempt was made to exclude or include those who had a prior history suggestive of thromboembolic disease. In many patients frequent determinations were made as pregnancy advanced and in the puerperium. As pregnancy progressed, careful and continuing search was made for clinical manifestations of thromboembolism.

Patients followed in the puerperium had been delivered normally, having received the usual anesthetic comprising nitrous oxide, oxygen and ether preceded by Nembutal and Demerol, and by paraldehyde in oil per rectum half an hour after the initial dose of Nembutal and Demerol. Immediately after parturition, the mother received Pitocin and after delivery of the placenta, Ergotrate. Ambulation was instituted on the first post-partum day, and the patients were discharged on the fifth day. One third of the subjects were seen again six weeks after delivery.

For the purpose of orientation certain concepts, terms and synonyms are briefly presented. The conversion of prothrombin to thrombin by thromboplastin and calcium requires two distinct protein factors in blood. The first of these is proaccelerin (otherwise known as plasma accelerator globulin, labile factor and factor V); this substance, circulating in the plasma in relatively inactive form, is activated by small amounts of thrombin, thus becoming accelerin (*serum* accelerator globulin or factor VI). The second factor, convertin (otherwise known as serum

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prothrombin conversion accelerator, Spca, stable factor, co-thromboplastin and factor VII), is *found in serum* and arises from a relatively inert precursor in the plasma (proconvertin or pro-Spca) when brought in contact with thromboplastin and calcium.

Determinations were made of plasma prothrombin, proconvertin and prothrombin-proconvertin by the Owren[1] procedure, with minor modifications.[2] Proaccelerin was measured by its clot-restorative effect on aged plasma.[3] In many subjects multiple observations (two to nine) were serially made during the last trimester of pregnancy. The ante-partum value

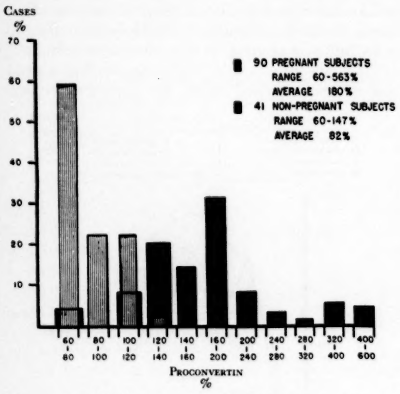

FIGURE 1. *Distribution of Plasma Proconvertin Activity in Pregnant and Nonpregnant Subjects.*

used in the calculations described below was the last one obtained before labor — in most cases within a few weeks of delivery.

RESULTS

Plasma Proconvertin

In striking contrast to a mean average plasma proconvertin level of 82 per cent in the nonpregnant group, with a range of 60 to 147 per cent, the value in 90 pregnant women before term was 180 per cent, with a range of 60 to 563 per cent (Fig. 1). In more than 80 per cent of the subjects the values exceeded all (except one) of the values in the nonpregnant group. In 10 cases it ranged from three to five times higher than the nonpregnant average, and in 4 it was more than five times this value.

A plot of all the results (Fig. 2) suggests a positive correlation between the proconvertin level and the duration of pregnancy. Higher values occurred preponderantly in the last trimester. In cases in which many serial observations were made, however, this relation was not always evident.

In 54 subjects the average proconvertin level observed three to seven days post partum was 121 per cent, compared with 156 per cent shortly before delivery. Most of them had dropped substantially by the third day. In 5 patients striking elevations (exceeding 150 per cent) were still present on the fourth to the fifth day. Determinations were made in 30 cases six weeks post partum. The mean average was 92 per cent (range, 60 to 120 per cent), contrasted

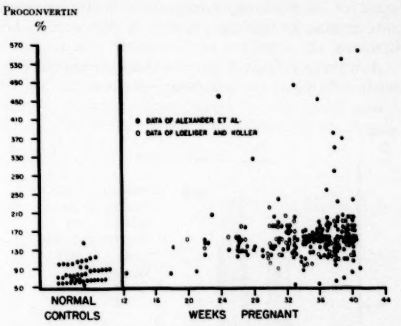

FIGURE 2. *Plot of All Proconvertin Determinations.*

with 126 per cent (range, 90 to 200 per cent) three to seven days post partum and 161 per cent (range, 124 to 240 per cent), ante partum in the same patients. Typical observations of the post-partum changes are presented in Figure 3.

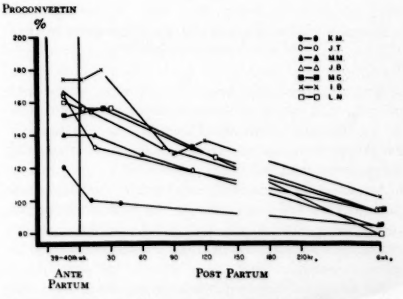

FIGURE 3. *Plasma Proconvertin in the Puerperium (Typical Curves).*

Plasma prothrombin was less significantly altered (Fig. 4). The mean ante-partum value was 111 per cent (range, 58 to 219 per cent), compared with 98 per cent for the nonpregnant group (range, 58 to 128 per cent). However, in 10 of the 90 pregnant subjects, the prothrombin was between 140 and 240 per cent of normal. In 5 the level returned to normal

within four days. In some of the others a high level persisted longer, but no later observations were made.

Of perhaps greater significance is the observation that striking decreases in prothrombin comparable to those in proconvertin were not observed in the puerperium. In 57 subjects the average plasma prothrombin value three to seven days post partum was the same as that ante partum (108 per cent). In 29 subjects tested, the six-week post-partum value averaged 91 per cent, compared with 106 per cent ante partum in the same group; in only 1 case did it exceed 100 (104 per cent).

As already intimated, there was no discernible correlation between the individual proconvertin values

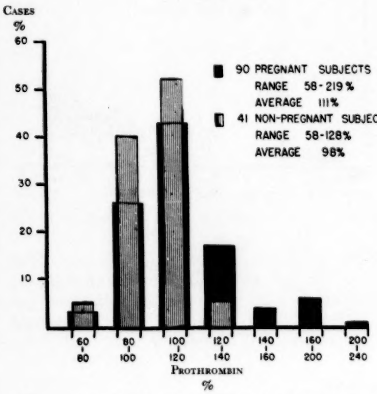

FIGURE 4. *Distribution of Plasma Prothrombin in Pregnant and Nonpregnant Subjects.*

and the prothrombin levels: there were many high proconvertin values without corresponding abnormality in the prothrombin. However, in all cases in which prothrombin exceeded 120 per cent of normal, the proconvertin was also elevated.

As was expected, determinations of prothrombin-proconvertin reflected changes in both constituents, contributing little to the significance of the data obtained by measurement of these constituents separately.

No abnormalities in plasma proaccelerin were observed.

The question arose whether the proconvertin levels described above represented convertin (*activated* serum accelerator) or proconvertin (the inactive precursor in the plasma) — that is, whether during pregnancy the proconvertin somehow became activated, thus appearing as an elevation of total convertin activity. Current technics do not permit ready distinction in the plasma. Experiments were performed to test this hypothesis by activation of the serums from pregnant subjects with thromboplastin and calcium. The results (Fig. 5 and Table 1) indicate that the proconvertin, despite its high level originally, could still be converted to a much more active form by incubation with thromboplastin and calcium. The activity could thus be enhanced from sixfold to ninefold. Although this *degree* of activation is the same as that in normal serum, the absolute activity thus attainable was extremely high. It gradually declined as incubation was continued. It should also be noted that the total *serum* convertin activity was twice that found in the corresponding plasma. These relations were no different from those seen in the normal nonpregnant subjects. Thus, the high plasma levels in pregnancy probably reflect proconvertin rather than its activated form, convertin.

It is noteworthy that in 1 subject, who had a dead fetus of undetermined cause, the proconvertin and

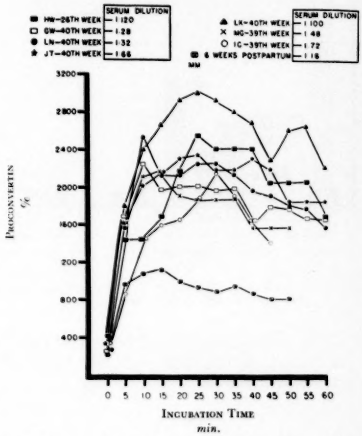

FIGURE 5. *Activation of Proconvertin by Thromboplastin and Calcium in Pregnancy.*
Incubation mixture comprises 1.5 ml. of human-brain thromboplastic extract, 1.5 ml. of 0.04 M calcium chloride and 1.5 ml. of serum diluted with saline solution.

prothrombin levels were comparable to those in the other pregnant patients.

No complications were observed in any of the other cases. Despite a careful search no clinical evidence of thromboembolism was found.

DISCUSSION

Ever since Virchow[4] originally postulated hypercoagulability as one of the triad* of etiologic factors in thromboembolic states, numerous attempts have been made to demonstrate abnormalities in clotting

*The other two in the triad are venous stasis and vascular injury.

factors in such conditions. Interest in this area becomes renewed with each improvement in analytical method and each disclosure of a new, hitherto unrecognized clotting factor. In view of recent progress in this area, we undertook to re-examine this question. It appeared to us that pregnancy was ideally suited for this purpose because it is a reversible physiologic (nonpathologic) state too frequently complicated by thromboembolism and because coagulation abnormalities reflecting the other side of the coin — that is, hemorrhagic phenomena — also occur in the gravid condition. This apparent paradox made pregnancy appealing as a fertile area for an effort to elucidate the thromboembolic derangement. Finally, retarded blood flow, another member of the Virchow triad, is well known to occur in pregnancy.

larger volume of plasma (with correspondingly less dilution of the plasma by the anticoagulant) than would obtain with the same addition to blood with higher hematocrit. Such an error, however, would appear as an *apparent* increase in any plasma constituent of about 15 per cent if relative hematocrit values were 45 per cent vis-à-vis 35 per cent packed cells. It will be noted that most of the observed elevations in proconvertin, and in a few of the prothrombin values, were much more marked.

Further evidence that dilution was not a significant factor in accounting for the results is the observation that plasma accelerator globulin was not elevated. Finally, most of the prothrombin values were only slightly elevated above those in the nonpregnant state. This is in agreement with observations of oth-

TABLE 1. *Activation of Proconvertin to Convertin by Thromboplastin and Calcium.*

PATIENT	DURATION OF PREGNANCY	PLASMA PROTHROMBIN	PLASMA PROCONVERTIN	SERUM CONVERTIN	MAXIMUM DEGREE OF ACTIVATION		ACTIVATED SERUM CONVERTIN *at 1 hr.*
	wk.	%	%	%	%	*factor*	%
H.W.	26	100	172	400	2520	X6.3	2160
G.W.	40	92	124	256	2240	X8.7	1652
L.N.	40	92	160	280	2536	X9.0	1568
J.T.	40	100	164	330	2376	X7.2	1848
M.G.	39	100	152	294	2160	X7.3	1584†
I.C.	40	100	160	314	2160	X6.8	1440‡
L.K.	40	100	156	328	2900	X9.1	2200
M.M.*	(6 wk. post partum)	84	86	180	1120	X6.2	800†

*At 40 wk., plasma prothrombin 90 per cent, plasma proconvertin 140 per cent & serum convertin 264 per cent.
†50-min. activity.
‡45-min. activity.

The observations described above demonstrate that the pregnant state is frequently associated with an increased level of circulating proconvertin, a clotting factor essential for the rapid conversion of prothrombin to thrombin by thromboplastin and calcium. Occasionally, plasma prothrombin is elevated, also. It seems that these changes develop as the gravid state advances and that they are reversible. Shortly after delivery, proconvertin drops rapidly; in all cases studied, it was well within normal limits six weeks post partum. Similar observations have been reported by other investigators,[5-7] who made determinations on random samples of blood from patients during the last trimester of pregnancy and at term. In a more recent study[8] proconvertin was found to increase gradually as pregnancy progressed up to a maximum observed on the third to the fourth day of the puerperium. In most of our cases, in contrast, a substantial drop had occurred by the third to the fifth day post partum.

The possibility that these results were an artifact in relation to the hydremia and decreased hematocrit in pregnancy was considered. In the obtaining of the blood sample, this would result in the addition of a fixed amount of anticoagulant to a relatively

ers.[6-8] Although there were cases in which the prothrombin was distinctly elevated, the many discrepancies between an elevated proconvertin and a normal prothrombin in the same blood sample substantiated the specificity of the abnormality in convertin complex.

Further study revealed that the component involved was proconvertin rather than its activated counterpart. The activity could be greatly enhanced by incubation with thromboplastin and calcium, in the usual manner and to the same degree as in nonpregnant subjects. The final activity attainable, however, was extremely high, as was expected in view of the high initial plasma level. This suggests that the gravid woman is particularly susceptible to rapid prothrombin conversion intravascularly if thromboplastic elements find their way into the circulation.

Changes in other coagulation factors have been described in the gravid state. Thus, substantial elevations in plasma fibrinogen are well known.[9] Why, and by what mechanism, proconvertin and fibrinogen should be selectively affected by pregnancy is not clear. It is reasonable to suppose that their elevation reflects an evolutional physiologic development that assures rapid and effective hemostasis after

parturition. Increased platelet adhesiveness observed during the early puerperium[10] may also serve this purpose.

Regardless of the mechanism by which these changes occur, the last trimester of pregnancy presents a constellation of conditions that, taken together, represent a truly hypercoagulable state that is potentially dangerous. The freeing of thromboplastic tissue elements from the gravid uterus or its confines into the circulation shortly before term, during labor or in the early puerperium may be all that is needed to initiate rapid clotting in accordance with mechanisms that have been well studied in vitro. Such embolization has been recognized as occurring in pregnancy, occasionally to the point of complete defibrination of the blood.[11,12] Moreover, the possibility of thromboembolism is considerably enhanced by the progressive slowing in venous blood flow in the leg and pelvic veins as pregnancy advances.[13] The setting for thromboembolism becomes even more ominous if the elevation in proconvertin persists (as in some of our cases) well into the puerperium, when platelet adhesiveness also becomes increased.[10] If blood flow is partially obstructed during this time for any reason, venous thrombosis and possible embolism merely awaits the intravascular appearance of thromboplastic elements from injured tissue.

Considerable support is provided this concept by recent experimental evidence. Wessler[14] has been able to induce intravascular coagulation readily in dogs anywhere in the arterial or venous circulation by a combination of impedance of blood flow and the systemic infusion of serum, or of purified serum fractions rich in the convertin complex. The clot, appearing at the point of partial obstruction, forms promptly after the material is injected at a point far removed from the site of infusion. It should be emphasized that the purified fraction from serum is devoid of prothrombin, thrombin, fibrinogen and accelerin, but contains activated convertin as well as its precursor. It probably also contains plasma thromboplastin component. These experimental conditions duplicate to an extraordinary degree those existing in pregnancy, particularly when it is realized that extensive coagulation and formation of serum containing convertin occur routinely after labor.

That no evidence of thromboembolism was disclosed despite a careful search, particularly in patients with extremely elevated proconvertin, deserves special comment. Clearly, the number of cases studied is too small to indicate any significant correlation between convertin levels and thrombotic manifestations. Also, it cannot be emphasized too strongly that there is no reliable clinical or laboratory test for an incipient, active or post-thrombotic condition.* Indeed, this constitutes one of the most important bottlenecks to investigation, better understanding and better management of this syndrome. Therefore, the fact that no evidence of thrombotic disease appeared in our subjects does not exclude its presence. Furthermore, experience has revealed that when clinical evidence of this disorder does appear, it is found most often from seven to ten days after delivery. Most of our patients were discharged on the fifth postpartum day, and were not seen again until six weeks post partum. Thus, there was little chance that thromboembolic disease would become manifest even though the total substrate for its development may have been present. Moreover, the concept being presented is that of a hypercoagulable state existing in association with pregnancy and *ready* to be triggered by certain circumstances. It is study of this state and of the conditions that may touch it off that appears promising.

*In striking contrast to what obtains in hypocoagulable states and hemorrhagic diatheses, in which bleeding becomes manifest promptly.

In the light of this concept, preventive and therapeutic aspects deserve mention. The indications for avoiding abdominal binders, garters and mechanical positions apt to impede blood flow are clear. Prompt ambulation after delivery is also important. The finding of persistently elevated proconvertin or prothrombin values, or both, in the puerperium warrants the consideration of anticoagulants. In our view they may well be indicated under these circumstances, and certainly if there is prior history or evidence of thromboembolic disease.

It is of interest that a hypocoagulable state, as compared with a normal adult, is observed in the infant in the immediate neonatal period. Low prothrombin and proconvertin values are well documented,[5,6] and more recently low values of plasma thromboplastin component have also been found.[15] These changes have been regarded as basic causes of hemorrhagic phenomena in the newborn. There is no discernible correlation between maternal, cord or infant blood proconvertin or prothrombin levels.[5-7] We have observed an extremely low proconvertin (about 1 per cent) in a thirty-six-hour-old baby with bleeding, born of a woman whose plasma value was 120 per cent. In another infant, with hemorrhagic disease of the newborn beginning forty-eight hours after birth, plasma proconvertin and prothrombin were less than 1 per cent whereas in the mother they were normal.

The findings in pregnancy indicate the need for similar studies in other clinical states complicated by thromboembolism. It would be unjustifiable to assume that the pathogenesis of this clinical syndrome is identical in all cases. Nevertheless, the facts, which are strikingly similar to the experimental conditions that produce intravascular coagulation, suggest a mechanism for the production of thromboembolic disease after surgery, myocardial infarction or other conditions in which venous stasis and proconvertin activation, through spontaneous clotting or through intravascular liberation of thromboplastic elements from tissues, may occur.

Summary and Conclusions

Plasma proconvertin was found to be elevated in pregnancy. It fell sharply toward normal in the early puerperium in most cases. Occasionally, high levels persisted longer, but they all became normal within six weeks post partum. Plasma prothrombin was less strikingly altered, but in some cases it was distinctly elevated. Proaccelerin was unaffected. No cases of thromboembolism were detected.

The high plasma convertin activity is referable to proconvertin rather than to its activated counterpart, convertin. Activation to extremely high levels could be induced in the usual manner by thromboplastin and calcium.

It is proposed that these changes, together with elevated fibrinogen, retarded blood flow in the legs, and increased platelet adhesiveness, provide a dangerous hypercoagulable state that can readily be triggered into intravascular clotting by minute amounts of thromboplastic elements liberated into the circulation from the gravid uterus or elsewhere.

We are indebted to Dr. Harold H. Rosenfield, obstetrician-in-chief, Beth Israel Hospital, and his staff for their co-operation in this study.

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ACTH AND CORTISONE THERAPY FOR RECURRENT MASSIVE GASTRIC HEMORRHAGE AFTER SUBTOTAL GASTRECTOMY*

Report of a Case

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BOSTON

THE PURPOSE of this report is to indicate the value of ACTH and cortisone in massive gastric bleeding due to capillary fragility associated with erosions of the gastric mucosa. This local capillary fragility may be converted to capillary resistance. The effectiveness of ACTH and cortisone in hemostasis has been described by several hematologists[1-8] in treatment of thrombocytopenic purpura. Here, the improvement in bleeding time corresponded with the rise in capillary resistance and not with the change in the platelet count.

Vascular Factors in Hemostasis

The mechanism whereby ACTH affects hemostasis is indicated at least partly by Robson and Duthie,[2] who observed a pronounced rise in capillary resistance with irradiation, nitrogen mustard, epinephrine and insulin hypoglycemia and suggested that a hypophyseal-adrenocortical mechanism was involved. The rise in capillary resistance was as great in patients given ACTH as in those given cortisone. The conclusion that ACTH and cortisone are effective in thrombocytopenia chiefly because of their action on the abnormal vascular fragility is also supported by Faloon, Greene and Lozner.[3]

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Method of ACTH Administration

In our previous experience most cases of ulceration or upper gastrointestinal hemorrhage occurred two or three weeks after the beginning of ACTH or cortisone administration. Therefore, intervals of a week of therapy were decided upon. After consultation with Astwood,[10] ACTHAR Gel was used daily intra-

muscularly. On the first day 40 units twice daily and, thereafter, 20 units were given. After a week of ACTH therapy, cortisone was given by mouth in 25-mg. tablets, four to six times daily.

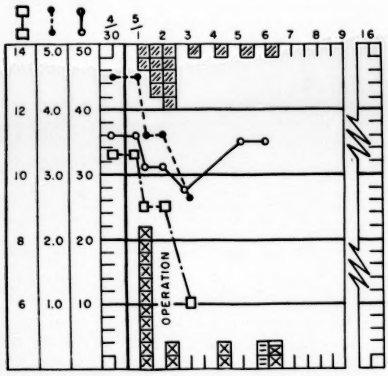

FIGURE 1. *Pertinent Data on the First Admission. A total of 7.5 liters of blood was given.*

When gastric bleeding recurred, as in the case described below, ACTH was started for another week, for a total of three weeks.

CASE REPORT

Mrs. M.C., a 33-year-old divorced woman, was first admitted to the hospital on April 30, 1954, complaining of right-upper-quadrant pain, associated with nausea.

for some tenderness with spasm in the right upper quadrant. The blood pressure was 120/68. The diagnosis was acute cholecystitis.

Examination of the blood showed a red-cell count of 4,430,000, with a hemoglobin of 13.5 gm. per 100 ml., and a white-cell count of 17,400, with a normal differential. The clotting time was 6½ minutes. A sternal puncture was done, and a normal bone-marrow biopsy obtained. The plasma fibrinogen, sodium, potassium, chloride and carbon dioxide values were normal. X-ray studies of the gall bladder gave no evidence of disease. The patient vomited blood and passed tarry and bloody stools (Fig. 1). The blood pressure was 68/58, and the pulse 130. She received 3500 ml. of whole blood during the day but was still in shock. Immediate operation was considered imperative.

A subtotal gastric resection was done. An ulcer was found to have penetrated through the duodenum and into the pancreas, which was swollen, hard and edematous. The duodenum was stripped from the pancreas to below the ulcer, the ulcer bed being left in the pancreas. A spurting branch of the gastroduodenal artery was found in the substance of the pancreas, and the bleeding was controlled by a suture. The duodenal stump was closed about a catheter, which was led out through a stab-wound lateral to the incision. The stomach was amputated at its proximal two fifths, and a retrocolic Polya-type anastomosis was made to the jejunum. The patient's condition steadily improved. The pathological report was chronic gastritis and duodenitis. The distal end of the duodenum at its resected margin showed a portion of chronic active ulcer that extended deep into the wall and up to the line of resection. There was no evidence of cancer.

Postoperatively, the patient became nervous and apprehensive, with hallucinations. The report of the psychiatric consultant indicated an alcoholic basis.

After the incisions had healed and all drains had been removed, she was asymptomatic. She was discharged from the hospital 17 days after admission.

Six days later she was readmitted to the hospital with a history of having vomited considerable amounts of bright-red blood. On the following day, she vomited approximately 6200 ml. of blood and retained gastric secretion. Continuous transfusions were given (Fig. 2). The blood pressure was maintained between 110/90 and 120/90 but gradually fell to 80/60. She became cold, clammy and apprehensive. Surgical intervention was necessary.

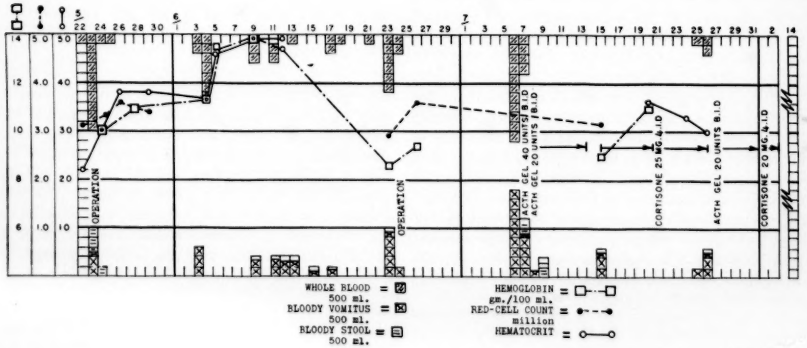

FIGURE 2. *Pertinent Data on the Second Admission (a Total of 28.5 Liters of Blood Was Given).*

The past and family histories were irrelevant.

She smoked 1½ packages of cigarettes and had several glasses of beer each day.

Physical examination revealed a well developed and well nourished woman and was within normal limits except

At the 2d operation the duodenum and stomach were exposed, and the previous duodenal ulcer was found to be half its original size and not bleeding. The entire duodenal and gastric mucous membrane was in a state of acute hyperemia and bled easily when wiped. The gastrojejunal anas-

tomosis was not bleeding. The stomach and duodenum were closed. The patient's condition began to improve. We were satisfied that the bleeding was from gastritis and duodenitis and not from the partially healed ulcer. After the 2d operation, she bled almost daily. Blood loss and replacement are shown in Figure 2.

One month after the 2d operation, she began to perspire profusely and vomited large amounts of blood intermittently. She complained of severe pains in the abdomen and went into shock, with a blood pressure of 100/90. She received whole blood continuously until evening, when surgery was indicated. The blood pressure continued to drop into the 80's. A Levin tube was inserted, and a large amount of dark-red fluid was obtained. The systolic pressure was maintained from 100 to 120. The pulse remained around 90.

At a 3d operation an incision was made through the previous scar. The duodenal fistula was followed down to the duodenum, the duodenal stump was opened and the duodenum was dissected from the pancreas. The original ulcer was completely healed; there was no bleeding at this point. Several large vessels leading into the duodenum were dissected out, doubly ligated and cut. A cuff of the duodenum was developed, and the duodenum was closed. The gastrojejunal anastomosis showed no induration or ulcer. There was some gastritis and duodenitis as previously found. Sponging made the gastric mucous membrane bleed very easily. The stomach was closed.

The patient continued to pass small amounts of changed blood by rectum almost daily until 12 days later, when she bled massively. It became a problem of supplying enough blood to keep ahead of the blood loss. On July 7 it was decided to give ACTH intramuscularly, as outlined above. Six days later, cortisone, 100 mg. by mouth daily, was started. On July 15 she had a moderate hematemesis and was given whole blood. The 2d course of ACTH was started and continued until July 21. Cortisone was then continued by mouth for 5 days.

On July 26 she vomited 1200 ml. of blood but did not give evidence of shock. The 3d and final course of ACTH was started and continued to August 1. There was no further bleeding. Cortisone was substituted for ACTH from August 2 to 5, when epigastric pain, not relieved by medication, recurred. At gastroscopy, the anastomosis was found to be functioning well, but there was a small marginal ulcer crater. Edema, redness and adherent secretion were seen about the ulcer. Gastric and jejunal biopsies showed a diffuse, interstitial infiltration by plasma cells, lymphocytes, monocytes and eosinophils—evidence of so-called chronic inflammation. No tumor cells were present.

By August 14, the wounds were healed, and the patient was discharged to her home on a strict medical regimen. Two months later, she had had no recurrence of pain or bleeding. Six months after discharge, she was asymptomatic and working full time.

Discussion

It is known that the first episode of bleeding was from a spurting branch of the gastroduodenal artery and that the bleeding was arrested by a suture followed by subtotal gastrectomy. At the time of the second operation, there was no bleeding ulcer, but there was diffuse gastritic bleeding. Again, at the third operation, no ulcer was seen in the duodenum, stomach or anastomosis. There was, however, a gastritis that was less in degree than that formerly observed, but the mucous membrane bled readily on the application of gauze. The bleeding continued at frequent intervals after the third operation, even after transfusions of whole blood. No abnormality was found in the bone-marrow biopsy, blood cells, platelets, fibrinogen, bleeding time, clotting time or clot reaction. After treatment with ACTH and cortisone, the bleeding diminished gradually in degree and frequency and finally ceased entirely. It may be postulated that there was some degree of localized purpura hemorrhagica in the stomach that was favorably affected by cortisone and ACTH. It is interesting, however, that after three weeks of ACTH and cortisone administration, a superficial, acute, marginal ulcer developed. Bleeding did not recur when the ACTH and cortisone were discontinued.

When the hemorrhagic tendency is severe, transfusions may be given, but the use of ACTH and cortisone may be of greater benefit.[2-8] Steroid therapy is of greatest value in temporary hemorrhagic emergencies and is most helpful early in the management of fulminating hemorrhage. There can be no doubt that blood transfusions must be given to replace blood lost in these cases of capillary fragility. The role of transfusions is still not clearly defined.[1] The percentage of patients who will experience symptoms from reactivated or newly developed ulcers while taking these hormones is not definitely known, but it seems to be relatively small.[9] Some patients with active duodenal ulcers have been known to become asymptomatic while taking ACTH or cortisone, but one should be cautious during steroid therapy.[11]

There are reports[12] on patients with rheumatoid arthritis known to have had pre-existing peptic ulcers but in whom reactivation of the ulcers did not occur despite the fact that ACTH or cortisone was administered for long periods.

In spite of well documented reports that administration of ACTH stimulates the gastric secretion of acid and pepsin and may be complicated by the development of peptic ulcer, there is as yet no conclusive evidence that the occurrence of peptic ulcer in man is actually preceded by elevated levels of pepsin or hydrochloric acid in gastric juice.[14]

As in the exacerbation of chronic ulcerative colitis with active bleeding, in which prolonged ACTH administration frequently gives the best clinical results, ACTH therapy may prove beneficial in uncontrollable and massive gastric hemorrhage, particularly after subtotal gastrectomy.

Summary and Conclusions

A case of recurrent massive gastrointestinal hemorrhage in a thirty-three-year-old housewife is described. Hemorrhage from an actively bleeding duodenal ulcer subsided after ligation of the ulcer bed and subtotal gastric resection. Recurrent massive gastric hemorrhage was followed by two gastrostomies in which the duodenal ulcer was found to be completely healed but the gastric mucosa exhibited easy bleeding and friability of tissue. In this recurrent and fulminating gastric hemorrhage, the use of ACTH appeared to be of greatest benefit. The ap-

pearance of a healing stomal ulcer and mucosal erosions was noted at gastroscopy after three weeks of ACTH administration. Hemorrhage ceased by the time the stomal ulceration appeared, and the ulcer healed rapidly on medical management.

With the apparent beneficial influence of ACTH and cortisone in this case of uncontrollable gastric bleeding, further investigation and trial appear indicated in this condition. Although ACTH appears to be more effective than cortisone in the control of bleeding, it may be a matter of dosage. More prolonged ACTH administration and variation in the dosage may be indicated in more protracted hemorrhage. Serum electrolyte deficiency should be constantly watched for and corrected.

Pre-existing or coincidental gastric or anastomotic ulcer does not appear to constitute a contraindication to steroid therapy when massive gastric hemorrhage does not respond to gastroduodenal-artery ligation, subtotal resection and multiple transfusions.

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SPECIAL ARTICLE

PSYCHIATRY AND MEDICAL PRACTICE IN A GENERAL HOSPITAL*

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VARIOUS interesting facets of the complex problem pertaining to the integration of psychiatry and medicine have been presented of late by a great number of psychiatrists and internists.[1-23] The purpose of this paper is not to discuss "psychosomatic medicine" or psychiatry as a medical specialty concerned mainly with neuroses and psychoses, but rather to delineate certain important aspects of the role of psychologic thought in medical practice. When referring to psychologic thought, I have in mind psychoanalytically oriented psychology, or what is frequently called dynamic or depth psychology. This psychologic system maintains that there is more to a person's emotional processes than appears on the surface and that his behavior patterns and attitudes are the result of conflicts between his deep strivings and his defensive methods against these strivings, developed in a slow adaptive process under the impact of environmental pressures and demands. However fixed these habitual behavior patterns may seem, one may recognize and diagnose the original underlying conflict. These conflicts are revived and intensified in times of stress. Illness always has to be understood as a stress situation, potentially traumatic and threatening to the psychologic equilibrium.

In this context the psychiatric — or, better, the medicopsychologic and medicopsychotherapeutic — approach is a most helpful tool, providing insight into the patient and into oneself and increasing the doctor's skill within his own specialty by blending his medical knowledge with the understanding of the patient's personality and psychological needs.

There are three main areas in which this knowledge proves to be especially helpful.

The Diagnostic Area

Differential diagnosis between organic and psychogenic conditions is of utmost significance. The diagnosis of psychogenic origin cannot be made simply by exclusion — for example, the fact that no organic basis can be found for a patient's symptoms is certainly not sufficient grounds for a diagnosis of hypochondriasis. Hypochondriasis is a specific entity,

*Parts of this article were presented at lectures in the New England Medical Center, Boston; the Psychiatric Hospital, Philadelphia; and the Sinai Hospital, Baltimore. The work reported is the result of experience with an extensive psychiatric teaching and training program in a general hospital. No attempt is made to describe in detail this program, which — since its inception in 1946 — has been made available to medical specialists and psychiatrists, social workers, dieticians, nurses and medical students. What is reported here constitutes some of the essential ideas that developed in the course of this project.

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characterized by a pathologic, anxious preoccupation with one's body, by the tendency to describe the subjective symptoms in an irrational, unrealistic form and by the tenacity of the complaints and an over-all suspicious attitude toward the doctor's reactions and comments. Another diagnosis that is frequently ventured on this general basis is that of hysteria. Hysteria is also a specific neurosis, in which the body's functions or dysfunctions are used to express certain meaningful emotional experiences or phantasies. It is characterized by phobic or conversion symptoms, or both, by a dramatic onset and by other signs of the hysterical personality. In brief, the diagnosis of a psychiatric condition must be made, like any medical diagnosis, only on the basis of positive clinical findings.

The differential diagnosis can be further complicated if there are anxiety reactions to organic disease or neurotic symptoms whose onset precedes and that are not directly related to the existing organic conditions. The difficulties of correct diagnosis under such circumstances are admittedly great, even for the psychiatric specialist, but there is reason to believe that they will diminish as medical schools and postgraduate training centers become increasingly aware of the importance of psychiatric knowledge and incorporate it into their teaching programs.

The Therapeutic Area

Psychotherapeutic Medicine

Not every psychiatric diagnosis requires intervention by the psychiatrist. The case may remain in the hands of the medical specialist for reasons of medical management as long as the diagnosis does not refer to a gross emotional disturbance. To decide such questions a psychiatric consultation may be necessary.

Beyond these special cases there is a broad, general area in medicine in which psychologic knowledge is basic and indispensable. I believe that this insight is necessary for the doctor to judge, first of all, what to tell a patient about his disease and how to inform him without traumatization but also without arousing his distrust that essential information is withheld. There is a great difference between the type of patient who "must not know" ("it is his doctor's responsibility") and the other who "*has* to know" and "does not want to be deceived."

A second problem is how to mobilize in the patient the greatest readiness to co-operate and accept the medical procedures and thus to share the responsibility with his doctor — whether by keeping the recommended bed rest or the dietary restrictions or by carrying out exercises in physiotherapy and so forth.

Thirdly, the physician should know how to consult with the family, so that he may add to his medical efforts the support of essential figures in the patient's environment if this proves necessary.

Finally, one should learn how to plan convalescent care or rehabilitation most effectively.

To illustrate the helpfulness of correct appreciation of psychologic factors, one may cite the case of a patient with myocardial infarction who also suffers from claustrophobia. When taking his bed rest alone in his room, this patient is thrown into panic. Since it is equally undesirable to expose a patient to physical or emotional exertion, he is permitted to take his "bed rest" in a deck chair on the front lawn.

More subtle and requiring deeper understanding is the question of what should be done with a forty-five-year-old man with myocardial infarct who has been accustomed to leave his bed every morning by way of a somersault. He is not an acrobat, which might make his behavior seem less noteworthy, but a "master electrician," as he constantly called himself — not just an electrician. This man, called "the Tiger" by the medical service because of his roaring irritability, came to the attention of the Psychiatric Department because, in spite of strict bed rest and prohibition even to shave, he fought with his sisters and slapped two of them at different visiting hours. He became highly excited and upset; the medical service considered restraining him in his bed. If one could understand what causes a man to leave his bed with a somersault in the morning in spite of being forty-five years of age and not a professional acrobat and why he calls himself, without any provocation, not an electrician but a master electrician, one might also learn to understand how to proceed in his medical management so that he could be kept in bed more quietly.

Before attempting this, one may consider more carefully the psychologic aspects of 4 patients lying in bed next to each other — all with the diagnosis of tuberculosis and all refusing to go to a tuberculosis sanatorium.

The Overconcerned, Worrying Patient

This type of patient appears anxious, is often phobic toward medical procedures such as hypodermics, talks to many people about "T.B.," tries to find out from nurses and visitors about his condition, asks his doctors over and over again how dangerously sick he is, observes with apprehension and obvious involvement the sickest people on the ward and, quite flustered, refuses to go to the sanatorium.

The Self-willed, Independent Patient

He seems somewhat aloof, keeps to himself or runs the ward, knows everything a little better than anyone else, including the professional staff. He does not like to talk about his sickness and is inclined to make light of it. He is sure he can manage on his own and adamantly refuses to go to a sanatorium.

The Dependent, Demanding Patient

He is always in the doctor's way, resents it deeply

if one spends less time with him on rounds than with a dying neighbor, and turns to the physician with every question that he could probably solve on his own (whether he should chew or swallow his pills, take them with water or juice, whether he can lie on his back at night and so forth). He is disinclined to let anybody distract him from his illness or, as he puts it, "make light" of his condition. In spite of this, one gains the impression that he does not take his medication regularly when nobody is around to pay attention to him. In general he seems to mind being sick less than not being taken care of with the most devoted and intense attention. He pleadingly refuses to leave the hospital and go to the sanatorium.

The Hostile, Querulous Patient

He likes to start arguments with everyone. Nothing is right — neither the food, nor the care, nor the thinking of the doctors or nurses. Nobody can fool *him*. Nobody can take it easy with *him* and shove him off to a sanatorium and thus get rid of the responsibility for him.

Anxiety Based on Disease

Observing the difficult behavior of these 4 patients, one can classify them as 4 different types. It does not seem too farfetched to assume that all of them suffer from anxieties connected with the diagnosis of tuberculosis. They cannot deny the threat of this illness, though they may try very hard to do so. The idea of an institution, with all its implications, and the ensuing reality problems seem to increase their anxiety and tension. But each of them reacts to this anxiety with his characteristic, habitual methods and attitudes. These behavior patterns have to be understood as part of the patient's personality. They represent his leading reactions to stress and are the result of a long history of adjustment. In brief, as he grows up with his constitutional endowment and environmental experiences, he learns to find ways and compromises between his needs and wishes on the one hand and the prohibitions against fulfilling them at any price and at every moment on the other. If these inner conflicts between impulses and defenses arrive at a certain equilibrium in the adjustment process, the results of it appear as personality traits. In times of increased conflicts, as under the pressure of anxieties, these personality characteristics increase in intensity in the attempt to maintain the inner balance. They therefore become more marked and less manageable than under average life conditions. This is the reason why the 4 patients behaved as described. It can easily be understood that none of them in their mounting anxiety could be expected to act differently even though this would make it easier for him and for his doctor.

One must therefore ask at this point not so much what one can request from the patient but what one can do to help him overcome his emotional resistance so that he can accept his doctor's recommendations.

In the *overconcerned, worrying patient* every potentially threatening situation will be linked with and increased by a variety of old anxieties, mainly stemming from childhood; sometimes, they are of quite irrational character, like the early nightmares. The patient's main problem lies in the helplessness of his childlike state and in the fact that these imagined dangers are almost always far more threatening than the reality may be. Thus, for the doctor in charge, two main avenues of approach are indicated, the first being to give the child in the patient the feeling of being protected by a strong, knowing, helpful doctor. It is the overly anxious patient with whom the doctor can take the position of the omnipotent, omniscient parental figure of the early years of childhood — a role that incidentally would create quite a problem with the next type, the "self-willed, independent" patient. Furthermore, in recognition of the fact that this overconcerned patient's imagination usually exceeds by far the actual danger of his illness, it is advisable to discuss with him the facts of his disease and the rationale of the treatment and of the expected cure. This will have to be done in a simple, appropriate, comprehensible form, with avoidance of any frightening or vague formulations. Never must one forget that what seems for the experienced doctor an ordinary phrase or everyday professional term may have a most alarming connotation for the worried lay person.

The self-willed, independent patient is accustomed to handling his apprehensions by being strong and by acting decisively, not letting any feeling of anxiety or insecurity develop. He is the patient who must not be patted on the head and told soothingly that everything will be all right. He must not be told that everything will be taken care of by his doctor or family or friends. This for him merely emphasizes the fact that he is sick and helpless and therefore, which he can tolerate least, weak. In contrast to this, one should let him know that one appreciates the difficulty in which he, as a man of his responsibilities, finds himself suddenly through his illness. But it also has to be emphasized at the same time that one does believe in his strength. "A man like you can do the seemingly impossible and accept the reality of the disease," represents the most helpful and acceptable approach. In brief, to maintain his equilibrium, the patient has to be helped to shift his self-respect, from being healthy and physically intact, to accepting the challenge of his illness and to manage it intelligently in spite of its threatening implications.

If one realizes that for *the dependent, demanding patient* the satisfaction derived from attention and care is more important even than his health and independence, some way has to be found by which he can obtain this essential gratification in a form that

leads to cure. Therefore, he cannot be requested to be stronger and more mature and to accept his doctor's recommendations on the basis of this strength. He will have to be supported in this difficult decision and shown how much it means to his doctor to have him get well. Furthermore, one must emphasize how important it is for the patient's well-being to have all the special care that a sanatorium is designed to give for his condition. One must ask him not to forget to keep the doctor or the social worker regularly informed of his situation. When his fears of being abandoned and deserted are thus allayed, he will no longer resist but will accept the recommendation because the idea of a sanatorium promises even more attention and consideration than he would receive in general practice or in a general hospital.

The hostile, querulous patient may well be the most difficult problem for the busy and harrassed doctor. Occasionally at least, his doctors lose their patience with him and suddenly react with anger and counterattacks to his critical and aggressive behavior. With this type of patient, to lose one's temper is especially contraindicated. This is exactly what he is looking for: to get into an argument — the more, the better. Then he does not have to pay attention to his own fears any longer and can blame his doctor for mismanaging the situation. If he refuses with anger to accept the doctor's advice, insists that insufficient attention has been paid to his condition, and that the doctors therefore are probably mistaken in their diagnoses, though they think they know all the answers, there seems to be only one constructive way of dealing with the situation. The doctor simply has to say, without taunting the patient, without getting tense and without having to control any anger, that he is sorry but would prefer not to answer all this. He has to state firmly and kindly that all he can do is to give advice as he sees it to the best of his conviction; that it is truly up to the patient to take this advice or to leave it; that the doctor sincerely would like to help, but that he cannot be expected to battle this out; and that it is the patient's health that is at stake and that he, therefore, has the final decision about his choice of physician and course of action. The doctor can only offer his opinion as a responsible advisor — the rest has to be up to the patient. By doing this the physician removes himself as a partner of this hostile scene and hands back to the patient the problem that he must decide, instead of letting him avoid the true issue by attacking his doctor and thus discharging his tension.

The same principles apply to other areas of medical planning such as dietary restrictions and rehabilitation. Whatever measures have to be instituted, the gain from understanding the patient's structure and his dominant central needs is considerable, permitting the doctor to deal with the patient's problems in a more appropriate and positive form.

The patient called the "Tiger" (the man who left his bed in the morning with a somersault), revealed his main problem in a few psychiatric interviews. Coming from an immigrant family, with a disappointingly weak father, he was the youngest child and the only son among three aggressive, domineering older sisters. Having always been his mother's favorite and main emotional support, he acquired his place in the family by ruling them sternly but justly; from an early age providing for all of them financially, he in turn insisted on being consulted and listened to in all family matters. Nevertheless, it seemed that in spite of his constant effort to hold this key position, his self-confidence had never been genuine. The somersaults and his insistence on being called a master electrician can be regarded as signs of his need to prove his strength and manly leadership. Characteristic for this inner insecurity was also one symptom in his marital relationship: he complained about disturbance of potency with his very quiet and meek young wife. The conclusion at which the service arrived was that the illness and the expected invalidism presented a threat to this man that might well increase the existing reality problems. It was clear that he could not go back to his job as a "master" electrician, and his aggressive and unreasonable outbursts against his visitors were expressions of his anxiety and sensitivity at being seen there in his weakness; they served the purpose of demonstrating that he was not down and out yet.

The medical management, therefore, carefully included whatever could be summoned up to re-establish the patient's hopes and self-esteem. In the whole approach, everything was emphasized that helped express tactfully how much the staff believed in him and in his ability to handle trying situations such as irritating relatives and their "condescending" concern. (This was, according to the patient, the attitude of his sisters to which he had reacted by attacking them physically.) Furthermore, as the central area of his anxieties was recognized, the therapeutic efforts concentrated already at this early stage on rehabilitation plans — to provide a program that was appropriate to his future physical condition, that was in keeping with his aptitude and skills as a technician in the field of electricity and, of greatest psychologic importance, that trained him for an activity to fulfill his need of being a "master something" instead of leading merely to a menial occupation providing for his basic financial needs. It was suggested that he switch to radio repair "because it requires expert understanding of technical problems." The patient was found, after a very short time, surrounded by books on radio, studying them with great interest. And, finally, he was promised — and this promise was kept — that he would receive therapy for his impotence later, on an outpatient

basis. As could be expected, the "Tiger" became one of the well adjusted and co-operative patients on the medical ward.

To summarize the aspects of rehabilitation as they developed in this case, it is not sufficient to consider the patient's physical condition, nor is it enough to test and evaluate his aptitude in the vocational field. Rather, one must add to these important factors the third essential one, the psychologic: What kind of activity holds a promise for the patient of fulfilling his emotional needs so that he will want to get well, and to get at it as soon as possible? This does not always require training for a job that has prestige attached to it, as in the case just discussed, but it may be equally necessary with other patients to put the emphasis in the opposite direction. For the dependent personality, for instance, it will be frightening to have to become a foreman or to have to take special responsibility on his future job. Training for a job in a work group or in an organized institution can fulfill far better such a patient's basic emotional needs. Experience with this type of patient has shown that jobs in hospitals, as elevator men or maintenance workers or librarians, offer ideal solutions. Or, when rehabilitation of a young girl with a hysterical personality with all the colorful affective, artistic and seductive qualities and needs that are part of it is evaluated, one must realize that even though she may be a good mathematician, she probably would be a misfit emotionally in an accountant's office; whereas a young compulsive woman, with her characteristic exacting attention to details, and her reserved, controlled and reliable, systematic ways of living, would be equally misplaced as a beautician or milliner.

These considerations enter into numerous problems of medical management, including the prescription of diets. To take only the last two patients as illustrations: if a diet is prescribed for the compulsive type of patient, one will do well to ask him to balance his calories on his own as skillfully and completely as he balances his checkbook. By doing this he is permitted to replace the frustrations of dieting by substitute gratifications in other areas of his personality needs. However, when one is dealing with a hysterical patient, it will be better to avoid adding to the burden of his diet the strain of being systematic about it. Instead, he will need as compensation for these restrictions his doctor's unfailing interest as well as frequent contact with his physician, who represents an emotionally important figure. Similar considerations are possible for the childlike, dependent type, whose diet should be set up around the foods that are most desirable and tempting for him, whereas the anxious patient may do best when the emphasis is put on the healthiest aspects of his diet.

A question frequently raised is, Why is this called psychotherapy, and why does it look like simple common sense and not at all like what is mostly expected as the result of complicated psychiatric thinking? What is called medical psychotherapy here differs in certain aspects from psychiatric therapy proper, which is concerned with neuroses, psychoses and severe emotional disturbances and has its special technics and special goals. However, psychiatric psychotherapy involves, in addition to many more complicated technical principles, the same aspects and technics that I have outlined here.[24,25] As far as the similarity to simple common sense is concerned, it may be said that any good psychiatric procedure comprises common sense. The complications of the psychiatric approach lie in the evaluation of the clinical data and in the elaboration of the theoretical system by means of which one arrives at one's conclusions. Once the main structure and probable etiology of the presenting symptom, in this case the leading personality trait, has been understood the therapeutic intervention follows logically and simply as in any clinical science.

The Area of Self-Awareness

There is a third area of significance to which psychologic insight may be applied constructively. Though it refers in the first place to the doctor and his self-awareness and to his understanding of himself and of his own emotional needs and conflicts, it is reflected in a variety of ways as it affects the treatment of his patients.

First and foremost, the doctor's intuitive functioning, his diagnostic ability, is at its best when unhampered by inhibitions, resistances, apprehensions and prejudices.

If with some patients a good and effective relation cannot be established, this is not always because the doctor does not understand the patient, but rather because he does not understand his own reaction to the patient or to the situation. Most doctors try to deal with this difficulty by relying on their habitual bedside manners: "the good, warm, understanding," the "strong, reserved all powerful," "the jovial, slightly teasing," "the charming, captivating" type of doctor. This armor seems usually to be acquired during medical school between the second and fourth years and is then often carried for good, regardless of whether it fits the situation or not, and whether it fits the patient or not.[15] It generally serves the purpose of a defensive system behind which the doctors hide whenever they are troubled or concerned over a patient or do not understand him or feel insecure.

It has become the interest of this service to study and discuss these attitudes with the professional personnel, especially with the house officers of the hospital. They are encouraged to observe how they relate themselves to their patients and how the patients in turn react to them. They are asked whether they can discover certain types of patients or certain sit-

uations that repeatedly lead to unsatisfactory interpersonal relations or specially smooth and good relations. Furthermore, they compare the results of their self-study with the experiences of their colleagues. On this basis they are enabled to determine whether there are differences in the skill with which they handle complaining, demanding, stubborn, clinging, independent, overanxious or unconcerned patients. After this has been established, the doctors, contrary to their usual tendency of maintaining that these patients simply are more difficult to handle than others, attempt now to add some self-investigation to learn why a certain type may seem more irritating or less manageable to them. It is gratifying to see how much can be discovered in this way.

For instance, a woman doctor thoroughly disliked "whining, delicately complaining female patients." She even tried to transfer them, whenever possible, to other doctors. On the other hand, she preferred and took on with real enthusiasm any patients who showed some "fighting spirit," though these patients usually present greater difficulties to most doctors. She requested an interview to find out what lay behind this aversion and almost dysfunction in her role as a physician. There was hardly anything one could contribute beyond what she told spontaneously in one hour. Since her early years, she had disliked the way her mother controlled the household, and especially her father, by headaches and failing health. She suspected her mother of being quite well and of using complaints purposefully and without true justification. She made up her mind always to be a good sport and to stand by her father as a strong, reliable soldier. (This decision greatly influenced her whole behavior — she really acted like a soldier, somewhat tough and rugged.) In going over these points, she understood clearly that she had carried this conflict into her professional relations, fighting innocent strangers as if they were her own mother, who had tried to subdue her by illness and complaints.

It should not be too difficult to understand that such insight helped to decrease the tension and difficulties that this doctor had lived out before with some of her patients.

For all physicians there are situations that are more charged than others in which unknown anxieties, prejudices against certain types of behavior and personal involvement with patients, interfere with one's ability to function freely. Unless these problems are understood and controlled, doctors cannot achieve their best potentialities.

This may be illustrated further by a special discussion pursued with the young medical doctors of this hospital. In a series of conferences, the marked lack of genuine interest in aging patients that the doctors showed was investigated and found to be due to a number of emotional factors, none of which had been recognized by the doctors before the extensive discussion but all of which were clearly perceived in the course of the conference.

It was discovered that it is not true, as many of them thought at first, that "aging patients do not offer the same interesting variety of diagnostic problems." Actually, they do, in addition to the more common general conditions characteristic of the aging organism. Thus, they are not "less interesting medically" than younger patients, but might be even more interesting.

However, "they are less promising as far as restitution is concerned." The emotional background of this criticism proved to refer to an adolescent daydream that determines for many young people the choice of medicine as their profession — namely, a rescue phantasy, centering around the wish to be the benevolent figure in whose hands the fates of people are put. This daydream of restoring all that goes wrong with human beings, of saving people, of being of supreme service and thus of becoming a beloved leader is certainly severely thwarted in work with the uncomfortable, ailing invalids in the older age group.

There is another, not too small group among the future doctors who are concerned with their own health and who chose a medical career to learn the secrets of how to fight disease and death. For these doctors, the elderly patients and particularly the patients with chronic conditions or cancer represent a threat, pointing up the fragility of the body and its gradual decline — unavoidable in spite of intense medical effort. Thus, they seem to be "less desirable" patients because of the discomfort, uneasiness and anxiety they create in these doctors.

Working with older patients involves another important factor that the doctor must become aware of if he is not to get entangled in it. This is especially true of the younger men and women who at the time of their internship have scarcely consolidated their feeling of independence. Having just broken away from the protective or controlling influence of their elders, they are suddenly, at this early stage of their professional existence, confronted with familiar figures resembling their parents and grandparents, aunts and uncles, who demand that they be taken care of and that the house officers be at their disposal, spend their time with them and listen respectfully to all that the patients find essential to complain about. The doctor easily feels put upon and uncomfortable in his new, faltering authoritative position and thus is inclined to avoid and, somewhat, to neglect these patients. He usually finds some kind of rationalization to justify his attitude. On the other hand, the same similarity between the parents and the older patients might stimulate some of the doctors to devote themselves most lovingly to the aged — and as long as this enhances their work and is not complicated by overwhelming concern, no objection to it is necessary.

Conclusions

In the doctor's work, psychologic understanding is of profound importance. It enables one to gain the most helpful perspective and awareness of one's own involvement as well as to comprehend the patient's life pattern and his basic reactions to his sickness and all it entails, including his relation to his physician. The doctor's own feeling of freedom and security provides clarity of thinking and the best potential for his intuitive diagnostic functioning. It permits him to observe the patient fully, protects him and the patient from rigid, defensive bedside manners and secures for the patient a great feeling of safety derived from this medical care. This, in turn, evokes in the patient all his positive strength, his willingness to co-operate and his constructive wish to get well and to do right by himself and by his doctor. Thus, the optimal psychosomatic condition is established that may make the difference between a patient who wants to live and the apathy and sabotage of the patient who lets himself die.

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MEDICAL PROGRESS

CHANGING INDICATIONS FOR PULMONARY RESECTION IN TUBERCULOSIS SURGERY*

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THE remarkable accomplishments of the antituberculous drugs, which today bring 80 per cent of the patients to the sputum-negative state, after six months of original treatment, have, in turn, affected the current indications for pulmonary resection. Formerly a last resort measure, pulmonary resection, at the inception of the chemotherapy era, was concerned almost exclusively with cases in which medical treatment had failed. As medical control improved with the institution of prolonged twin-drug chemotherapy, tuberculous empyemas, endobronchial disease and destroyed lobes or lungs became much less frequent.

The emphasis on surgical therapy for control of the patient's disease has shifted to the possibilities inherent in prophylactic resection for the prevention of future relapse. A plan of selection, based on the anticipation of treatment failures ("predictable failures"), may offer greater immediate and long-term gains in the elimination of this chronic, relapsing disease.

It is the purpose of this communication to describe present surgical concepts, based on experience with nearly 500 resections for tuberculosis.

The Closed Lesion with Negative Sputum

In 1950, at the instigation of E. M. Medlar, the surgeons at the Veterans Administration Hospital, Sunmount, New York, were among the first to begin the resection of noncavitary residual lesions. In the first specimen removed by wedge resection on October 10, 1950, tubercle bacilli were demonstrated on smear. This specimen, according to Dr. Medlar's statement,[1] was "as far as I know, the first dated, primary minimal pulmonary tuberculous lesion in which the roentgenographic findings, the clinical history, the effect of clinical management (18 months bed rest, 4 months, SM, 1 Gm daily, and PAS, 12 Gms. daily), and the

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observations at operation could be compared with the actual pathologic condition."

From a study of approximately 1000 serial sections of this lesion, he gave the following explanation:

> . . . the disease started as a minute microscopic focus which necrosed, spilled out, and thus gave rise to several other foci in adjacent normal lung parenchyma. All of these new foci did not behave alike, due probably to a different dosage of bacilli. One proceeded to organization by scar formation, without undergoing necrosis, and four proceeded to necrosis. The necrotic debris in the latter foci were in such a physical state that sloughing into a bronchus could easily have occurred, had such a structure been strategically located.
>
> A different anatomical relationship of larger bronchi to necrotic foci could easily have occurred in this case had the parenchymal involvement been in an area one millimeter or so closer to the bronchial distribution. From this it would appear that the relation of a parenchymal pneumonic lesion to a well-formed bronchus may well be the determining factor in the intra pulmonary dissemination of the disease.[2]

Subsequent proof of the essential unpredictability of this residual necrotic lesion has been furnished on both a pathological and a clinical basis.[2]

The report[3] that simple excision might be useful by removing the nidus of potential relapse gave rise to conflicting opinions in the surgical literature[4] that have not yet been reconciled.

Regardless of the pathological implications of the closed necrotic focus, the essence of this debate seems to be in the incidence of clinical relapse after long-term follow-up study of parallel resected and nonresected series.

To eliminate as many variables as possible and at the same time to evaluate the effect of resection on the frequency of relapse, a protocol for random selection was introduced at the twelfth combined Army, Navy and Veterans Administration Conference on the Chemotherapy of Tuberculosis.[5] Patients with bacteriologically proved tuberculosis, with or without a cavity at the beginning of original chemotherapy, were considered eligible for inclusion in the random group when the target point had been reached. Such a point has been defined as an arbitrary one at which lesions have appeared stable on serial films for at least three months, the sputum has been negative for a similar period, and the presence of a cavity can be reasonably excluded by recent planigrams.

The Veterans Administration Hospital at Sunmount, New York, has participated in this program since June 1, 1953. As of December 31, 1954, a total of 59 cases, reaching the target point, have been selected at random for resection of residual necrotic lesions, and 26 for nonresection.[6] In follow-up observations extending up to eighteen months, 2 "relapses" have occurred in the resected, and 2 in the nonresected group. Both "relapses" in the resected group were bacteriologic, 1 consisting of a *single* positive gastric culture. In neither case was any unfavorable change seen on x-ray examination.

Similarly, in the nonresected group, both relapses were clinically benign. One was bacteriologic, with one positive culture a month after the target point, and the other was associated with a transient unfavorable x-ray change. Although no bacteriologic relapse occurred in the latter case, the recently changing lesion was resected within four weeks without change in chemotherapy. Cultures of the lesion were negative for tubercle bacilli.

It is apparent that, within the limits of this study, there is no significant difference in the incidence of relapse between patients with and those without resection of the residual closed lesion. In this connection, Jenkins and his associates[7] reported a relapse rate of 6 per cent in 110 nonresected target-point patients followed for periods of four months to three years. A much larger number of patients, with comparable data, will have to be followed for five years or more before more than preliminary conclusions can be reached. In relation to the long-term study of patients with closed lesions, Mitchell[8] found a mortality of 22 per cent among 472 patients with advanced pulmonary tuberculosis but with no cavity on admission who were followed for a twenty-year period. It may be recalled, however, that none of these patients had the benefit of prolonged antituberculous chemotherapy, or serial planigrams to rule out the presence of a small cavitary focus.

In addition to the routine inclusion of closed lesions on a random basis, other indications for the excision of closed lesions have been recognized in patients not eligible for inclusion as random subjects under the terms of the protocol. It is realized that these recommendations are made largely on an empirical basis. As yet, no factual data are available that permit a surgical policy to do more than improve what appears to be an already favorable outlook.

Indications for Excision

All suspected tuberculomas are removed for the sake of both diagnosis and treatment. Particularly, surgery is considered to be indicated when there has been x-ray instability or unfavorable changes in the lesion, with or without specific therapy.

Undiagnosed or peripheral pulmonary "coin lesions" are resected because of the ever-present possibility of malignant change particularly in the older age group.

Dense lesions, probably conglomerate caseous nodules, which measure 4 cm. or more in diameter, are recommended for excision, particularly if they are discrete and require removal of minimal lung tissue.

In patients with residual closed lesions who, because of "constitutional inadequacy," psychopathic personality, alcoholism, systemic disease such as diabetes, age, sex or race, or other factors that affect the prognosis, and who, because of these preceding qualities, will not follow a recommended medical regimen, or are not amenable to further medical supervision, resection is recommended.

Patients exhibiting resistant organisms to one or more drugs before sputum conversion were excluded from the random protocol, and resection was advised.

These patients were all resected in the sputum-negative state, without a wait for the target point to be reached and yet, presumably, with complete antibacterial control. It is important that there were no tuberculous complications of resection surgery in the entire group.

The Open Lesion with Negative Sputum

In addition to patients with a closed lesion and negative sputum in whom the indications for pulmonary resection are unsettled, there are patients in whom the sputum has been converted to the negative state, after a period of original or retreatment chemotherapy, and yet open lesions persist on serial planigrams. The phenomenon of sputum conversion for three months or longer, associated with residual annular shadows, is observed in this group.[9] Such cases constitute 20 to 40 per cent of the total at various periods throughout twelve months of chemotherapy.

Of 35 patients given original streptomycin and PAS therapy for eight months or longer, whose sputum was converted but who demonstrated residual open lesions radiologically, and for whom resection was not or could not be done, 18 (51 per cent) relapsed to a frankly active state.[10] Eight of these relapses (apparent on bacteriologic or x-ray study) occurred during chemotherapy, and 10 occurred largely within a year of discontinuance of drugs.

Uncertainty whether these annular shadows were residual tuberculous cavities, blebs, cysts or bronchial deformities, in addition to a clinical relapse rate of 50 per cent, resulted in the decision to recommend resection of these lesions. Accordingly, in January, 1953, a program of systematic resection of these radiolucent areas whenever feasible was begun. In the past two years, 149 resections have been performed on 121 patients with equivocal or unequivocal open lesions on x-ray study and with negative sputum for at least three months before surgery.

Indeed, the major surgical group of the resection program for tuberculosis, which includes the patients with closed lesions and negative sputum, open lesions and negative sputum and open lesions and positive sputum, consists of cases in which the sputum is converted to negative through the effect of chemotherapeutic agents and yet no satisfactory cavity closure occurs.

The clinical problem of prognosis for this group is, simply, that it is impossible to predict from serial x-ray examination whether an individual lesion represents a cavity, bleb or bronchial dilatation, and whether or not it harbors viable tubercle bacilli. Certainly, some of these lesions are innocuous, for, in many cases, one must qualify the preoperative radiographic impression by stating that the lesion in question represents an equivocal cavity.

A great deal of attention has been given to the so-called open healing of cavities.[11] Thought to be largely a phenomenon of prolonged chemotherapy, particularly with isoniazid, these cavities are lined with fibrous connective tissue, and are often associated clinically with negative sputum and gastric cultures. However, a certain number of cavities (which are almost all connected macroscopically with the bronchial tree) have necrotic fragments in their walls in which viable tubercle bacilli are lodged.[12,13] There is no roentgenographic method presently available to distinguish which cavities are ostensibly healed and which are incompletely sloughed. Since the latter have been found by most investigators to yield a high percentage of positive cultures, and the anatomic state of healing as judged by an x-ray shadow remains indeterminate, excision of this type of lesion is recommended.

Attempts have been made to obtain a clinical and pathological correlation that will help predict the possible behavior of these lesions.[14]

It is regretted that all of the resected open lesions with negative sputum have not yet been subject to complete histologic examination. Dr. E. M. Medlar[15] has agreed to review this material and has kindly examined occasional specimens. Gross observations suggest the following preliminary conclusions:

The majority of open negative lesions are tuberculous cavities.

Blebs, cysts and related phenomena of local obstructive emphysema form a minority of the group of annular shadows.

Ectatic bronchi and bronchial developmental anomalies account for a third small part of the residual "open" lesions.

Careful bacteriologic examinations of all open lesions, with random sampling of adjacent closed lesions, gives a rate of almost 50 per cent positive specimen cultures in the 147 patients with open lesions and negative sputum. The fact, then, that the majority of such lesions represent tuberculous cavities and that at least half the resected material yields viable bacilli is a possible explanation for the relapse rate seen in the patients with unresected open lesions and negative sputum while they are still receiving drugs, or during the first twelve to eighteen months after drugs have been discontinued.

Surgical experience with these patients has included a variety of pulmonary resections. In general, one or two segments or a lobe were removed. Wedging of residual closed lesions was performed whenever feasible, depending on the size and location of the lesions. The removal of all palpable disease, the theoretical aim, is accomplished in approximately two thirds of the cases. As one would anticipate, the

extent of excision has been, in most cases, greater than that in the group with closed residual noncavitary lesions.

The absence of major tuberculous complications after resection in the sputum-negative patient with closed lesions suggested that local excisions, including wedges, subsegments and segments, could be performed with the same safety in the group with open lesions and negative sputum.

Confidence that the absence of positive sputum was necessarily a guarantee of effective drug control was shaken by 3 reactivations occurring within a six-month period in 1954. Each patient had demonstrated negative sputum by culture for at least three months before resection. In each, a bisegmental excision was performed (apical posterior segment of the upper lobe), with the impression that 95 per cent, or more, of all apparent disease had been removed. In this group, the reappearance of tubercle bacilli in the sputum during the first two or three postoperative months, as well as x-ray evidence of active exudative disease adjacent to the operative site, made the diagnosis of reactivation (or local spread) unequivocal.

Review of all surgical complications in the patients with open lesions and negative sputum yielded 5 additional cases of postresection reactivation occurring in earlier years (1951-1953).

These 8 examples of failure of both drugs and surgery to control the disease had several factors in common. One patient had a primary resected specimen, which was negative on culture. Evidence of tuberculous reactivation on the ipsilateral side was apparent on the x-ray film three weeks whereas bacteriologic relapse did not occur until four months after operation. At that time bacilli susceptible to both streptomycin and PAS were present in the sputum.

Of the 7 patients who had positive specimens, only 1 had susceptible organisms cultured from the tissue. Although this man had slowly resolving infiltration during convalescence from a superior segmental excision on the right, positive sputum did not appear for three and a half years, when tubercle bacilli, fully resistant to two drugs, were demonstrated.

In each of the remaining patients whose resected specimen was positive by culture or guinea-pig inoculation the organisms were moderately or completely resistant to the drugs being administered. When the bacilli reappeared in the sputum, signifying bacteriologic relapse, they exhibited the same resistance pattern that was apparent in the resected tissue. Furthermore, in retrospect, each of the 7 patients had demonstrated beginning resistance to one or more drugs before the sputum had been converted to the negative state preoperatively.

In essence, then, operations were being performed on patients with little or no effective chemotherapy—patients actually with open lesions and negative sputum with resistant bacilli. Ultimate control of the disease was achieved by further surgical resection in 5 cases (superior division of the left upper lobe in 1, secondary lobectomies in 3 and pneumonectomy in 1). The sixth patient was arrested by a change in drug regimen. The remaining patient died suddenly of pulmonary hemorrhage, three months postoperatively, before secondary resection was contemplated.

The occurrence of a major tuberculous complication in what had been considered a uniform, relatively innocuous group, led to an analysis of the surgically treated patients with open lesions and negative sputum. Data were available on 147 patients operated on from January, 1951, to January, 1955. These data, which are presented in detail elsewhere,[16] permit the following conclusions:

The achievement of sputum conversion by original or repeated chemotherapy does not necessarily guarantee effective drug control for purposes of pulmonary resection.

Various degrees of drug resistance to one or more drugs developed before sputum conversion in 12 of 68 patients (17.5 per cent) receiving original treatment, but were twice as frequent in 33 of 79 patients (41 per cent) in the retreatment group.

In a third of patients showing some degree of resistance in preconversion sputum, a positive specimen was obtained.

Patients with evidence of a resistance pattern in the sputum, before reaching the negative state, will show equivalent, if not greater, resistance in the resected tissues that are positive on culture.

The group with open lesions and negative sputum is not uniform from the surgical standpoint. Among those who show preconversion resistance will be a dangerous few (10 per cent) who are actually in the *resistant* state when operated upon.

In 7 of 13 patients with uncertain drug control, limited excisions, such as segmental or wedge resections, resulted in prompt implantation reactivation of disease in the operative site.

Although any type of limited procedure to effect removal of all apparent disease has been safely carried out in 90 per cent of the patients with open lesions and negative sputum, primary lobectomy is performed in the dangerous or unpredictable 10 per cent.

The Open Lesion with Positive Sputum

The patient who completes an original or retreatment program of nine to twelve months, with sputum intermittently positive or unconverted and with a remaining cavitary lesion, is perhaps the major problem of the tuberculosis surgeon today. The fact that such a patient may be considered a chemotherapeutic failure is no comfort to the surgeon who is urged to correct this situation. In fact, he knows that this

failure of drugs to control the bacillary state in the presence of unyielding morphology is a distinct threat to the success of any treatment plan he may recommend.

The rate of open (cavitary), positive disease at the end of six to eight months in patients who received original twin-drug combinations is approximately 20 per cent in this hospital. The number is almost double when they are retreatment cases. These figures are comparable to composite tables drawn up by the Veterans Administration, Army and Navy for the entire country.[17] It is recognized that any given incidence of end results varies with such factors as age, sex, race, extent and distribution of disease, different drug combinations and many other factors.

The magnitude of this problem is apparent when it is recalled that in this group, which represents uncontrolled tuberculosis and in which the major morbidity and mortality of the disease result, the prognosis is depressing unless surgery can arrest the progress of the disease.

The reputation of thoracoplasty in achieving arrest of the patient with cavitary tuberculosis is enviable, and presents a definite challenge for pulmonary resection. During the inception of specific antimicrobial drugs and pioneer efforts in resection, it was natural to continue the recommendation of thoracoplasty, a therapy of proved worth, for this type of patient.

The recognition that antituberculous drugs could suppress or eliminate the bacillary population from the sputum, and the bacteriologic distinction of resistance and susceptibility, called attention to the fact that effective drug coverage was of primary importance in reducing or eliminating complications after resection.

A dramatic illustration of this was shown by Overholt, Hayes and Wilson,[18] who operated on 108 patients within a month or less of the start of original chemotherapy. They found that the duration of preoperative chemotherapy in no way altered the postoperative morbidity or mortality, provided certain surgical criteria were met. These were as follows:

Pulmonary reserve should be adequate.

The offending lesion should be confined to the unit resected—whether a segment, lobe or lung.

The resection should be planned as the primary procedure.

The resection should be properly timed, with adequate rest and preoperative drug therapy to control toxicity, to reduce excessive bronchial secretions and to stabilize lesions in other areas.

Again, the duration of preoperative chemotherapy, or operative procedures, did not appear to influence the percentage of patients who were well with negative sputum at one and a half to three and a half years of follow-up study.

Numerous reports since 1950[19,20] attest to the steadily diminishing frequency of postoperative empyemas, bronchopleural fistulas and tuberculous reactivations. This has been the consequence of more prolonged and efficient antituberculous drug regimens and continued improvement in resection technics.

On the premise that adequate antimicrobial coverage is a major factor in any surgical effort, particularly resection, the patients with sputum-positive cavity lesions have been divided into those with sputum bacilli that are resistant or susceptible to the drugs they are receiving at the time surgery is contemplated.[21]

Since every patient with an open lesion and positive sputum eventually is theoretically or actually completely susceptible to drugs during the first few months of treatment, there would be little gain in prolonging treatment to the emergence of bacterial resistance if such an outcome could be predicted.

With this time factor in mind, certain radiologic and bacteriologic findings are considered useful indications of these potential drug failures during the early months of chemotherapy. The radiologic findings are as follows:

Cavity size of 3 cm. or over.

Cavity location in the extreme apical or posterior segment, and those lesions persisting under a thoracoplasty.

Cavity configuration—thick walled, hanging or stellate.

Multiple adjacent cavities, or those with a honeycomb appearance.

Cavity with associated bronchial abnormalities such as stenosis and ectasia.

Bacteriologic considerations are as follows:

Failure of the sputum to become negative in the first six months of therapy.

Failure to reduce significantly the bacillary content of the sputum in the first three months of chemotherapy.

Development of partial resistance to two or more drugs.

When one or more of these radiologic findings are present, the cavity will usually not close, and in the presence of one or more of the bacteriologic findings, sputum conversion is unlikely. In other words, failure of the sputum to become negative or relapse to the positive state during continued chemotherapy is always associated with persistence of open lesions.[9]

Most of the cavities present at the onset of treatment that are going to close during a subsequent period of observation in a total of twelve months or more will have closed within the first six months; the same statement is true of sputum conversion. In a group of cases, most of which were moderately advanced, the six-month observation point appears to be the time at which to determine to use some other adjunct to the chemotherapeutic regimen.[22]

Further support for the policy of early selection of and operation on patients with anticipated open lesions and positive sputum is provided by surgical results with 83 resections in 75 patients with sputum-positive cavitary lesions. Of 28 receiving original chemotherapy, 19 still had susceptible organisms at the time of operation. There was 1 major tuberculous complication. Of the remaining 9 patients who had resistant organisms, there were tuberculous complications in 5.

Similarly, in the retreatment susceptible group, there were 3 major tuberculous complications among 22 resections, and in the resistant group, 9 among 33 resections.

It has been found that, when positive cultures are obtained from the resected tissues of these patients (a rate over 90 per cent for open lesions and positive sputum), bacilli will be present with equivalent or greater drug resistance than was found in the last preoperative sputum. This may, in part, explain the frequency of complications after resection in the patients without effective drug control.

Discussion

It is believed that a distinction can be made between the patient who completes an original or retreatment period with negative sputum and closed or open lesions and the one who fails not only to close a cavity but also to exhibit sputum conversion. In the former, elective surgery may be considered prophylactic, whereas the requirement for surgery in the latter is almost of necessity therapeutic.

The place of resection in the treatment of a destroyed lung, lobar bronchiectasis and fibrostenosis of a major bronchus has changed very little.[23] Fortunately, the success of antituberculous drugs has dramatically reduced the occurrence of these conditions.

The indications for resection surgery in the patient with negative sputum at any point during the latter part of his chemotherapy program, whether the lesion is open or closed, must be based upon the propensity of his residual disease to cause future relapses. A vital consideration is the anatomic age (stage of healing) of the lesion.[24]

The element of unpredictability, inherent in the morphology of the residual lesion after treatment (particularly the filled-in cavity), then, is the key for surgical rationale. Its subsequent reflection in a minimal clinical relapse rate for the target-point residua, but a greater frequency in the group with open lesions, and negative sputum, has formed the basis for the policy of resection discussed above.

From the arbitrary standpoint that tubercle bacilli harbored in these lesions are capable under certain conditions of producing, at any time, progressive tuberculosis, the safety of any residual lesion is considered to be a highly relative and individual matter. Until more rigid criteria can be delineated on a clinical, radiologic and pathological basis for the selection of surgical candidates, the indications will be founded on the comparative relapse rate in similar resected and nonresected groups.

Regardless of the sputum state (although a negative sputum is desirable because it implies chemotherapeutic control or relatively quiescent disease) resection is regarded as the surgical treatment of choice.

As mentioned above tuberculous complications have been very rare in patients with closed lesions and negative sputum, open lesions and negative sputum or open lesions and positive sputum, provided drug-susceptible organisms were present in sputum and resected tissue. In patients with cavitary lesions and negative or positive sputum at the time of surgery, major tuberculous complications have reached the rate of nearly 33 per cent when resistant bacilli were found in the sputum or resected tissues. Such patients who are being retreated are likely to become resistant to the current regimen.[25]

Although considerable emphasis has been given to the sputum state before surgery, assembled Veterans Administration statistics[17] mention only a 10 per cent difference, in favor of satisfactory results after resection, in the sputum-negative patient.

Since microscopic spillage of tubercle bacilli may be estimated to occur in nearly 100 per cent of the cases during pulmonary resection, it seems apparent that every effort should be made to avoid spreading organisms into the parenchyma of the remaining lung. Such spillage has been innocuous when occurring in the patient with good chemotherapeutic coverage. However, in the patient with known or unsuspected resistant bacilli, the lack of effective drugs, when spillage occurs, is regarded as a major factor in postoperative reactivations.

With the foregoing observations in mind, the following recommendations have been adopted. Because of the known higher rate of space problems after segmental resections, and the inevitable opening of more raw surfaces in this procedure than in the average lobectomy, anything less than lobectomy has been avoided for the patient known or suspected to have resistant bacilli or ineffective drug control.

The ideal situation in the patient with an open (cavitary) lesion and positive or negative sputum in whom bacilli are resistant to two or three of the commonly used drugs who is undergoing resection, with Viomycin or Pyrazinamide coverage, is to accomplish lobectomy and be favored with anatomically complete fissures. In the absence of this, every effort should be made to repleuralize the area of incomplete fissure separation. One must also resist the temptation to wedge closed lesions from the middle or lower lobes of such patients. If the question of resection of the superior segment arises in addition to the upper lobe, the indications should include a known or suspected cavitary lesion, closed lesions over

4 cm. in diameter and the possibility of minimal or no spillage when the superior segment is dissected from the basilar segments. Blunt dissection of a superior segment, from heavily seeded basilar segments (3 to 5 mm. in diameter) has resulted in an appreciable number of fistulas, local empyemas and late tuberculous reactivation in the remaining portion of the lower lobe.

Since this policy has been in effect, no significant postoperative complications have occurred, regardless of the sputum state or lack of chemotherapy.

No discussion of experience with resection surgery in tuberculosis would be complete without a brief consideration of the role of chemotherapy in the postoperative period. The largest group of resection failures, at present, is made up of patients who have left the hospital against medical advice after receiving one or two months of postoperative chemotherapy. Because excisional therapy is only an incident, and not the end point, in the over-all management, a minimum of six months of drug therapy after operation has arbitrarily been recommended. In the event that viable bacilli are recovered from open or closed lesions, this period has been extended to nine months and, in some cases, to twelve months. One of the major concerns is the amount, distribution and size of residual disease. In patients with borderline drug coverage at the time of surgery and resistance to one or more drugs found in cultures of resected material, it seems reasonable, with present knowledge, to advise treatment for a full year after resection. Future estimates of postoperative drug requirements will also have to be based on long-term relapse rates between parallel operated and nonoperated groups, and among resected groups with and without apparent residual disease.

Summary and Conclusions

The introduction of specific antituberculous drugs and the subsequent refinements in administration over the past five years have resulted in a considerable proportion of patients ending their treatment period with negative sputum.

This is undoubtedly a desirable situation if the safety of relapse from the residual lesion, whether open or closed, could be assured. Current studies indicate that the frequency with which tubercle bacilli may be recovered from "closed" necrotic lesions is directly related to the anatomic age (stage of healing) of the lesion.

Present evidence suggests that patients with non-air-containing nodules, either filled in or unsloughed, and negative sputum bacteriology during prolonged antimicrobial therapy need not routinely be subjected to resection for prophylactic reasons. Certain specific indications that may exist in this group are described.

Patients completing treatment that results in sputum conversion but a residual annular shadow, not distinguishable from a tuberculous cavity, have been found actually to have an unhealed cavity in over half the resected cases. In addition, viable tubercle bacilli have been recovered in nearly half these specimens. This fact, correlated with a clinical relapse rate of approximately 51 per cent in the patients with unresected, open lesions and negative lesions, still on chemotherapy, or within twelve months after cessation of drugs, has caused this group to be included routinely in the indications for resection. The preliminary results of a short term follow-up study in the patients with resected, open lesions and negative sputum show a relapse rate of approximately 10 per cent. A more detailed report is in progress.

Although, by definition, the group with open lesions and negative sputum have had negative sputum cultures for at least three months before resection, experience has shown that the patients are not uniform from the bacteriologic standpoint.

Any type of surgical excision has proved safe in the patient with satisfactory coverage by antituberculous drugs. Negative sputum preoperatively, however, may not guarantee effective control for pulmonary resection. In a third of the group with open lesions and negative sputum (45 patients), resistant strains were apparent to one or more drugs before sputum conversion. Thirteen of these 45 patients, representing 10 per cent of the over-all group, exhibited resistant bacilli in the operative specimen. Local excision in these patients may invite early or late reactivations of disease.

A resection plan that avoids segmental excision in patients with open lesions and negative or positive sputums who become resistant to therapy is suggested.

Without these bacteriologic data available, a surgeon can suspect that resistant tubercle bacilli may be found in a patient with delay in converting sputum (beyond the first three or four months) who reaches the open negative state with an unequivocal cavity after prolonged original or retreatment chemotherapy. Similarly, a patient with a cavitary lesion and positive sputum who is being retreated is much more likely to become resistant to his current regimen and to have resistant bacilli in the resected material. In these patients, simple excision is probably unwise, and such a seemingly radical operation as lobectomy may be the safest and most conservative procedure if it avoids secondary lobectomy or thoracoplasty.

With the impression that control of the disease is of paramount importance in the safety of pulmonary resections, an effort has been made to anticipate, on the basis of certain morphologic and bacteriologic criteria, the eventual patient with an open (cavitary) lesion and positive sputum, and to recommend resection at a time when full drug control may be assured.

I am indebted to Dr. James W. Raleigh, chief, Tuberculosis Service, Veterans Administration Hospital, Sunmount, New York, for suggestions on the medical aspects of this

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MEDICAL INTELLIGENCE

ACUTE PANCREATITIS AFTER PROLONGED FAST AND SUBSEQUENT SURFEIT*

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BOSTON

IT has been almost customary in all reports dealing with acute pancreatitis to refer to the famous case reported by Opie.[1] The appeal of this report lay in the fact that a logical cause-and-effect relation was established between the obstruction of the distal common bile duct by an impacted stone and the development of acute pancreatitis. Innumerable subsequent reports concerned with the problem of acute pancreatitis have demonstrated that a single etiologic factor cannot be implicated to explain all cases of pancreatitis. Recent reviews of the subject[2,3] summarize well the many causes that must be considered when inflammatory disease of the pancreas occurs; these include infection, trauma, vascular disturbances, activation of the secretory mechanism of the gland in the presence of stasis or obstruction, regurgitation of bile, metaplasia of duct epithelium, inspissated secretion, biliary-tract disease, the Shwartzman reaction and other related variants of these general headings. It is undoubtedly true that there is no single etiologic factor by which the development of acute pancreatitis can be explained, but if any common denominator exists in the majority of the cases, it is probably a partial or complete obstruction of the pancreatic ducts in the presence of an actively secreting gland.

The following case is unique not in the clinical picture presented but rather in the factors involved in the development of acute pancreatitis in a young, healthy college student:

Case Report

L. E. (M.G.H. 882053), an 18-year-old college freshman, was transferred from the college infirmary to the Massachusetts General Hospital because the attending physicians were worried about the possibility of a ruptured spleen.

On admission the problem was concerned with the cause of severe epigastric and left-upper-quadrant pain of about 30 hours' duration.

After all the details of the patient's recent activities had been assorted, it seemed probable that the history of his present illness dated back 2 weeks, when he returned to college from the Christmas vacation. He was a member of the freshman wrestling team, and it was the plan for the

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coming matches to have him wrestle in the lightweight class (123 pounds). Unfortunately, his actual weight at return to college was 133 pounds, and he therefore went on a strict diet consisting of lean meat, green vegetables and tea, with no starches, sugar or fats. After 9 days on this diet, however, he had lost only 5 pounds, and, to wrestle in the lightweight class, he had to lose 5 more pounds within the next 3 days. Consequently, he limited his oral intake even more strictly and added to his dietary program frequent visits to the steam room and a stringent limitation of liquids by mouth. This rigorous program met with success since he weighed in on the morning of the match at exactly 123 pounds, having lost the necessary weight to bring him down below the maximum limit of the class.

By this time he was naturally extremely hungry and immediately after the official weighing-in, he embarked on what is fair to call a Gargantuan program of repletion. Within the next hour he had a large breakfast, followed immediately by a second meal. In this period he consumed orange juice, eggs, toast, cocoa, bananas, cream, oatmeal, minute steak, potatoes, tea and fruit in sizable amounts. He had an excellent recollection of exactly what he had eaten, and the total amount can be best summarized by a dietary analysis, which showed that within 1 hour he ingested a total of 2244 calories, which could be further broken down into 238 gm. of carbohydrate, 53 gm. of protein and 120 gm. of fat.

Half an hour after he had finished this double meal, pain in the left upper portion of the abdomen that radiated through to the back developed. After a hot shower and a rest, this pain seemed to subside but returned again within 1 hour and progressed steadily in severity. He made the short bus trip with the wrestling team but fortunately did not have to wrestle since his match was won by default. During the return trip from the match he became extremely uncomfortable, and about 10 hours after the onset of the 1st mild pain, he reported to the college infirmary in severe discomfort. During the night he vomited for the 1st time, and by the following day he had signs of obvious disorder of the upper abdomen. He was then transferred to the Massachusetts General Hospital with a tentative diagnosis of ruptured spleen.

On admission physical examination was not remarkable except for the abdomen. There was extreme tenderness in the epigastrium, left upper quadrant and left flank, with spasm of the abdominal muscles in the same general area. Only an occasional peristaltic sound could be heard. There was, however, no radiation of pain to the top of the left shoulder at any time, and x-ray studies showed no free air in the peritoneal cavity and none of the roentgenologic signs that might suggest rupture or subcapsular hematoma of the spleen. The hemoglobin was 15 gm. per 100 ml., and the white-cell count 12,000, with 77 per cent neutrophils. Urinalysis was negative, and excretory urograms showed normally functioning kidneys.

The diagnosis of ruptured spleen remained a disturbing possibility, but because of the relation of the onset of this pain to the obvious dietary indiscretion, attention was given to the gastrointestinal tract. When a blood amylase, which had been drawn on admission, was reported as 52 Russell units (normal 8 to 18 units), the diagnosis seemed fairly clear. During the 24 hours after admission the patient's clinical condition deteriorated; the abdomen became progressively more distended and tympanitic, and all peristaltic sounds disappeared. Treatment consisted of gastric suction, atropine, penicillin and streptomycin, parenteral infusions of fluids and electrolytes and sedation with barbiturates. About 36 hours after admission, he began to improve and by the 4th hospital day the abdomen was entirely negative to examination, peristalsis was present and active, and fluids were started by mouth. The temperature returned to normal on the 6th hospital day, and from then on his oral intake was steadily increased. On the 12th day after admission, he was discharged back to the college infirmary on a 6-meal bland diet. Daily amylase determinations were carried out during the hospital stay, and it was not until the 10th day that the level returned to normal. Biligrafin studies before discharge showed a normal gall bladder and biliary tree.

After discharge the stools were a little bulky and greasy for a few days and then returned to normal. Ten months after the acute episode he was entirely asymptomatic in every respect and was taking a normal diet without digestive symptoms of any kind.

Discussion

The interesting aspect of this case is the occurrence of relatively severe acute pancreatitis in a healthy, active eighteen-year-old boy without biliary-tract disease. It seemed reasonable to assume that the rigid period of starvation followed by excessive oral intake was the cause of the pancreatitis. It is postulated that the prolonged period of starvation and dehydration might well have resulted in a thick, inspissated secretion in the ductal system of the pancreas and that the intense stimulation of the pancreas resulting from an intake of over 2000 calories within an hour might well have produced such a sudden increase in pressure within the pancreatic ducts that the rupture of multiple acini would occur, bringing about the typical picture of acute pancreatitis.

This sequence of events is analogous to the method of producing acute pancreatitis in laboratory animals by ligation of the pancreatic duct and subsequent stimulation of the pancreas by feeding.[4,5]

Summary

A case is reported in which acute pancreatitis in a healthy, athletic eighteen-year-old boy followed the sudden ingestion of a huge amount of food after a period of prolonged starvation and dehydration.

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MEDICAL INTELLIGENCE BY THE LONDON POST

Persisting Nursing Shortage — Homosexuality and Prostitution — Heroin Reprieved

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RECRUITMENT to the nursing profession continues to lag far behind the requirements of the hospital service. Outspoken comments have recently been made on why this shortage of nurses persists. A correspondent to the *Daily Telegraph* suggests that

it is because in no other profession is a young girl subjected to arduous and often dirty manual labor, vigorous and often intolerant discipline and inadequate rates of pay. These views have stimulated a lively correspondence. They have been endorsed by some writers and disputed by others. It is true that in the past the student nurse was expected to undertake the cleaning of the ward, but this is not so today. Similarly, the harsh discipline that was once inflicted on the nurse in training is almost a relic of the past. There may be some in authority who are overbearing and short-tempered, but they are not confined to the nursing profession. The rates of pay for nurses are certainly still not comparable with those in other walks of life, but there must be other factors in addition to those already mentioned.

The ease with which women are now accepted as medical students has been offered as an alternative explanation of the present nursing shortage. Indeed, one writer has suggested that although women are ideal as nurses, they are unsuitable as doctors. He believes that there is a rhythm in nursing that is lacking in doctoring, in which there is no acknowledged time for meals, rest or off-duty; he has said that rhythm suits women and that havoc ensues when it is disturbed. They become unable to sleep, think or conduct themselves selflessly in the interests of their patients. Such a harsh dismissal of a woman's place in medicine was quickly challenged by a woman medical student. She questioned 10 of her female student colleagues, not one of whom would have chosen nursing as an alternative profession if she had been unable to train for medicine.

There are doubtless many aspects of nursing that make it unattractive as a profession to young women today. On the other hand, it does seem that the real cause of the persistent nursing shortage lies deeper than most of those commonly mentioned. Indeed, it is probably the sense of vocation that is not as strong as before. One might well say of nursing what Sir William Osler said of medicine: "It is an art, not a trade; a calling, not a business, a calling in which your heart will be exercised equally with your head." Until this spirit of vocational service is abroad once more, the nursing shortage is likely to persist.

* * *

A special committee of the British Medical Association recently considered the problems relating to homosexuality and prostitution, and its report has been submitted as a memorandum of evidence to the Government committee at present considering these matters.

No assessment of the incidence of homosexuality in this country is available, but police statistics reflect a definite increase in homosexual practice. The usually quoted incidence of male homosexuality in Great Britain is about 3 per cent. This is clearly too low an estimate, but it is not thought that the rate is as high as the figure quoted in Kinsey's report for the United States (37 per cent of the male population having some homosexual experience and 10 per cent being exclusively homosexual for at least three years of their life). The true incidence in this country probably lies about halfway between these extremes.

Two main groups of homosexuals are recognized by the Committee, one of them essential and the other acquired. The former group may well have a genetic basis for the inversion and are incapable of heterosexual relationships. Homosexual habits may be acquired as the result of a number of circumstances. Chief among these are segregation of the sexes, seduction in childhood or adolescence, continuance into adult life of schoolboy or schoolgirl conduct and defective home life.

The Committee did not regard the problems of female homosexuality as presenting any serious social problem. On the other hand, many aspects of male homosexuality raise considerable problems. Homosexual practices when carried out in public places naturally cause offense. Even more serious is the alleged tendency of male homosexuals to place their loyalty to one another above their loyalty to the institution they serve and on the part of homosexuals in positions of authority to give preferential treatment to homosexuals, and to require homosexual subjection as expedient for promotion.

The main causes of prostitution as seen by the Committee are bad training and bad example at home and faults in character and in attitude to life. The methods of controlling both homosexuality and prostitution concern the revision of the law relating to these practices and the psychotherapeutic approach. In the view of the Committee the law needs to be both deterrent and reformatory, but existing law and practice do not meet the needs satisfactorily. The apparent disproportion of sentences imposed on homosexuals is sometimes disturbing, especially to the medical expert who may have full knowledge of the offender.

The Committee suggested the formation of special teams of workers, composed of a prison officer, the prison doctor, a psychiatrist, a religious worker and a social worker, to be available in prisons and observation centers for treatment and reformation of prisoners likely to benefit.

In particular, the religious approach may be helpful, and in an appendix to its report the Committee records the case histories of 10 men and 4 women who obtained release as a result of religious conversion. These persons were able to overcome their sexual orientation because they acquired a new creative passion that gave a greater satisfaction.

* * *

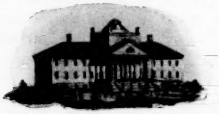
The ban on the manufacture of heroin that was due to be imposed on January 1 was postponed at the last

minute. Lord Jowitt, lately the opposition leader in the House of Lords, was able to cast doubt on its legality and so persuaded the Government to call it off. Lord Jowitt maintained that by imposing this ban under the provisions of the Dangerous Drugs Act of 1951 the Home Secretary was exceeding his powers, since the Act empowered him to control the manufacture of drugs by license but not to extinguish it.

There is no doubt that the Government was conscious of a strongly divided public opinion on the matter and also of the divergence of medical opinion on the question of whether adequate substitutes for heroin exist. Furthermore, many people believed that a grave choice in social values had possibly been wrongly made. For these reasons, the eleventh-hour reprieve for heroin has been generally welcomed. Licenses are to be granted for its manufacture during this year, when further investigations into the value of the drug will be made.

Thus, for the time being, the Government has been restrained from intervening between a physician and his patient by cutting off the supply of an established drug.

CASE RECORDS
OF THE
MASSACHUSETTS GENERAL HOSPITAL



Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

BENJAMIN CASTLEMAN, M.D., *Editor*

VIRGINIA W. TOWNE, *Assistant Editor*

CASE 42081

PRESENTATION OF CASE

First admission. A sixty-two-year-old woman was admitted to the hospital because of progressive loss of vision in the right eye.

Eight or nine weeks previously she noted "spots" or "fish scales" in front of the right eye, followed in a few weeks by blurring of vision in the lower field of the right eye. There was no serious impairment of vision until seven days before admission, when almost complete blindness and ptosis of the right eye developed over a period of one or two days. At the same time there was severe right-sided orbital and frontal pain that subsided a few days before admission. She experienced some nausea during this period. No generalized headache, paresthesias, diplopia, stiffness of the neck or bruit had been noted.

She was known to have been hypertensive for a year and for several months before admission was treated with phenobarbital.

Physical examination revealed complete ptosis of the right eye and palsy of the right third nerve. The right pupil was widely dilated and did not react to light. There was no proptosis or tenderness. She was able to count fingers at 2 or 3 feet, more easily in the upper than in the lower half of the field. Central vision was more impaired than peripheral vision. The disk appeared normal, but the retinal arteries were very attenuated and the veins slightly overfilled and tortuous. Sensation over the face and forehead was normal. The left eye was normal. The general physical examination was negative.

FIGURE 1. *Posteroanterior View of the Skull, Showing Erosion of the Right Anterior Clinoid Process and Medial Aspect of the Right Lesser Sphenoid Wing (Arrows).*

The temperature was 98.6°F., the pulse 80, and the respirations 20. The blood pressure was 188 systolic, 102 diastolic.

Urinalysis was negative. Examination of the blood revealed a hemoglobin of 12.2 gm. per 100 ml. The fasting blood sugar was 103 mg., and the nonprotein nitrogen 30 mg. per 100 ml. The blood Hinton test was negative. X-ray films of the skull, sinuses and teeth were normal (Fig. 1 and 2).

The patient remained in the hospital for five days, during which there were no changes in the clinical status.

Final admission (three months later). In the interval the ptosis of the right eye persisted. She carried on her usual activities but ate poorly and lost approxi-

mately 30 pounds. About twenty-four hours before admission she began to complain of generalized headache. On the morning of admission she was found to be drowsy and confused.

Physical examination showed an oriented but drowsy woman who tended to fall asleep while talking. Vision in the right eye could not be tested, but the other findings in this eye were unchanged. There were drooping of the left side of the face and weakness

FIGURE 2. *Lateral View of the Skull, Showing Erosion of the Right Anterior Clinoid Process (Arrow). There is no enlargement of the pituitary fossa.*

and increased tone in the left arm and leg. There was an extensor plantar response on the left.

The temperature was 100°F. by rectum, the pulse 100, and the respirations 20. The blood pressure was 170 systolic, 110 diastolic.

The urine gave a + test for albumin; the sediment contained 100 white cells per high-power field. Examination of the blood revealed a white-cell count of 10,400, with a normal differential. The hemoglobin was 14.4 gm. per 100 ml. The serum sodium was 137 milliequiv., the chloride 99 milliequiv., and the potassium 4.0 milliequiv. per liter, and the nonprotein nitrogen 13 mg. per 100 ml. An x-ray film of the chest was normal.

The patient became progressively more drowsy and was in coma on the second hospital day. At this time she was noted to be motionless and unresponsive to pinprick and plantar stimulation. Flexion of the neck was moderately limited, and she moaned slightly. Each pupil measured more than 3 mm. and was fixed to light. The corneal reflexes were absent. The deep tendon reflexes were obtained in the left arm and knee but not in the right. The ankle jerks were absent bilaterally. The plantar response was extensor on the left, and no reaction was obtained on the right. The fundi were not definitely abnormal. A lumbar puncture revealed faintly xanthochromic cerebrospinal fluid under an initial pressure equivalent to 520 mm. of water. The fluid contained 131 red cells and 17 lymphocytes per cubic millimeter; the protein was 155 mg. per 100 ml. On the third hospital day there was slight withdrawal of the right foot to painful stimulation and chewing movements when the tongue was depressed, but otherwise her condition was unchanged. A second lumbar puncture again showed xanthochromic cerebrospinal fluid under an initial pressure equivalent to 520 mm. of water. On the fourth hospital day gastric-tube feedings were started. A third lumbar puncture revealed an initial cerebrospinal-fluid pressure equivalent to 260 mm. of water and persistence of the xanthochromia. Later that day the blood pressure gradually fell to 80 systolic, 40 diastolic. The pulse rose to 140, and the temperature rose to 107°F. by rectum and she died.

DIFFERENTIAL DIAGNOSIS

DR. JAMES C. WHITE*: This woman for two months had gradual impairment of vision on the right, with greater loss in the lower field of vision, and then ptosis and third-nerve paralysis. The pain began in the fronto-orbital region — in other words, in the area innervated by the ophthalmic division of the fifth nerve. Those three signs pinpoint with great accuracy a lesion in the cavernous sinus, where the first division of the fifth and the oculomotor nerves lie close together. If the lesion is further back in the cavernous sinus, the maxillary or the mandibular division of the fifth nerve and even the motor root may be involved.

As Dr. Adams and I wrote last spring,[1] if an aneurysm rises out of the cavernous sinus near the anterior clinoid process it can impinge on the optic nerve and produce blindness, but it usually also causes optic atrophy, which this woman did not have. She had the suggestion of central scotoma because she saw objects better in the periphery of the field of vision; pressure on the optic nerve in front of the chiasm could do that. She had no loss of facial sensibility, which she should have had with a lesion in the cavernous sinus. If the physicians had examined the corneal sensibility, they might have found that it was impaired. That is usually the first evidence of pressure on the ophthalmic nerve. Aneurysms in this area are likely to be on a hypertensive basis. Dandy[2] described several, which were fusiform enlargements

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of both the supraclinoid and infraclinoid portions of the internal carotid artery. This woman had had hypertension of the wide-pulse-pressure type for a year — the systolic pressure was almost twice the diastolic.

I do not think I have to consider thrombosis of the sinus, for although that would give these signs, it would also produce engorgement of the eye, fever and so on.

A tumor is another possibility. As the history unfolded I thought more about tumor. There was an obvious, complete third-nerve paralysis that persisted. I suppose the fourth, sixth and olfactory nerves that run close to that region of the cavernous sinus were tested, but nothing was said about them in the history. The great impairment of the lower field of vision, which did not lead to optic atrophy, should have resulted from pressure on the upper part of the optic nerve going to the superior part of the retina. Can this occur from a mass expanding upward? I should like to ask Dr. Cogan a question that has just occurred to me. If there was diffuse pressure upward near the chiasm, might not the optic nerve be angulated and press against the anterior upper rim of the optic foramen, thus causing a reduction of innervation of the upper part of the retina and therefore difficulty with the lower field of vision? Another explanation could be compression of the upper fibers of the optic nerve against the anterior cerebral artery, which crosses just above it. There was no papilledema. Nothing was said about increase in the size of the blind spot. There was attenuation of the retinal arteries, which may have been caused by the hypertension, but there was no arteriovenous nicking. I doubt whether the dilated retinal veins without arteriovenous nicking would result from hypertension alone. There may have been pressure upon the superior orbital fissure, with a rise in venous pressure and retarded escape of the blood from the orbit.

May I see the films of the skull? In the case that Dr. Adams and I reported the anterior clinoid process was thinned by pressure. If the patient under discussion had an aneurysm, calcium may be visible in the films.

DR. JOSEPH HANELIN: There are definite changes indicating an abnormality in the area suggested to Dr. White from the history. There is distinct erosion of the right anterior clinoid process and of the medial third of the right lesser sphenoid wing. The pituitary fossa is not enlarged. There may be slight erosion of the dorsum sellae, but that structure is not well shown in these films. I am unable to identify any abnormal calcification.

DR. WHITE: Were the films taken during the first or the second admission?

DR. HANELIN: During the first admission. No films were made later.

DR. WHITE: The x-ray films confirm that this mass was anterior to the posterior clinoid process, where the oculomotor nerve is also exposed to pressure in its course across the interpeduncular cistern. Aneurysm is one of the two chief contenders for this diagnosis; if the mass had been posterior, where the posterior communicating artery originates, the patient could also have had signs of third-nerve involvement. Such a mass should not affect the optic nerve, which was involved; it should not cause pain in the area supplied by the ophthalmic division of the fifth nerve, and should not produce the x-ray changes mentioned by Dr. Hanelin.

It would be helpful to know whether during the three months between admissions she lost the sense of smell, had involvement of other ocular muscles or lost sensibility about the face. She lost a great deal of weight, which would not be likely to occur with aneurysm or even with an intracerebral tumor unless it was a carcinoma that had metastasized to the brain. A malignant lesion seems to me to be an important consideration. The sudden onset of drowsiness, confusion and headache, all of which had existed for only a couple of days, make one think of a rapidly expanding intracranial mass, either a tumor or an aneurysm that had perhaps bled. In addition to the third-nerve paralysis, there was clear-cut left-sided hemiplegia, a drooping of the left side of the face, which I suppose was of the central, not the peripheral type, and the Babinski response. She was too sick for localizing neurologic signs to be elicited. She could not be tested for loss of half the visual field or loss of smell and other cranial-nerve sensation. She did not have papilledema or optic atrophy; yet she had a very high intracranial pressure equivalent to over 500 mm. of water. I think I have to explain the absence of papilledema by rapidity of rise in intracranial pressure, for it takes about a week for a full-blown papilledema to develop. Otherwise one would expect to find papilledema with a cerebrospinal-fluid pressure equivalent to 500 mm. of water. The deep tendon reflexes were obtained only on the left. I should expect them to have been hyperactive on the left and normal on the right, but perhaps because she was moribund the reflexes diminished and dropped out as they do with an acute injury to the spinal cord. The ankle jerks had dropped out. The bilateral absence of corneal response, I think, was also due to the moribund state. It would be difficult to think of a neurologic lesion causing bilateral loss of corneal sensation that would not also produce many other signs.

The general physical examination was not particularly remarkable, nor were the laboratory findings. The fact that the x-ray film of the chest was normal rules out cancer in the lung, which so often metastasizes to the brain, but it is important to emphasize that any cancer from an internal organ — thyroid gland, lung, breast or gastrointestinal tract — can metastasize to the brain. The patient was too sick for a gastrointestinal series or intravenous pyelo-

grams, but it would be helpful to know if there was an abdominal mass or any mass felt on pelvic examination.

DR. H. THOMAS BALLANTINE: No; there was not.

DR. WHITE: Three lumbar punctures were done. Why the second and third were done when the initial pressure was equivalent to 500 mm. of water is difficult to understand because they did not show much. The elevated protein could be found with any type of tumor, with an intracerebral hematoma or with a diffuse disease like encephalitis, but I am sure she did not have that, for the symptoms were focal. If she had been on the Neurosurgical Service, I think at least an arsenic scan and an electroencephalogram would have been done; the former might have shown a tumor.

If there was a tumor, it was very rapidly growing and malignant. It would be interesting to know why the pressure rose so rapidly. There is a general belief that a single tumor would not cause such a rapid increase unless it obstructed the outflow of spinal fluid to produce obstructive hydrocephalus. Therefore, I have to speculate about localization and the type of tumor. Certainly, the initial symptoms make one think of an aneurysm near the anterior end of the cavernous sinus and expanding into the superior clinoid portion to involve the optic nerve. Such a mass should also have involved the other intracranial nerves in the sinus and should have produced optic atrophy, although the optic atrophy may have been present but impossible to elicit. The lesion must also have expanded upward to involve the internal capsule and thus to have caused the left hemiplegia.

A number of lesions can be ruled out without much further thought — subdural clot, tuberculoma, brain abscess and parasitic disease. The two important ones to consider are brain tumor and aneurysm. Aneurysms in the cavernous sinus do not often grow to be large and do not often rupture. Jefferson[3] reported one, however, that filled the whole middle fossa, although it did not bleed because it was underneath the dura and therefore had an extra covering. It would be unlikely for an aneurysm to bleed and to produce an intracerebral hematoma without also producing more than 131 red cells per cubic millimeter in the cerebrospinal fluid. That situation would be much more likely with an aneurysm of the posterior communicating artery. I do not believe that she had that type of aneurysm.

Tumor, particularly a metastatic one, could give rise to all these symptoms. Carcinoma lateral to the cavernous sinus in contact with the meninges can elevate the protein in the cerebrospinal fluid and release carcinoma cells that resemble lymphocytes into the spinal fluid. The 17 "lymphocytes" found in the spinal fluid may have been cancer cells. The patient had lost about 30 pounds in weight, which makes one think of metastatic cancer rather than of aneurysm or primary brain tumor. She did not vomit over a long period so she must have had general malaise and cachexia, with loss of weight. The unusually rapid elevation of the intracranial pressure, which was too rapid to produce papilledema, and the rapid onset of coma are difficult to account for on the basis of a single expanding tumor except one strategically situated to block the egress of the spinal fluid from the ventricles. Therefore, the diagnosis that I must make is brain tumor, most probably metastatic carcinoma, causing compression of the optic and oculomotor nerves with late involvement of the internal capsule and very likely with an obstructive hydrocephalus. I do not know why there was no optic atrophy.

DR. DAVID G. COGAN: Were films of the chest taken?

DR. HANELIN: Yes; we have a film taken with a portable machine that does not show any obvious disease in the lungs. The patient was quite sick at the time.

DR. COGAN: Were the sphenoid sinuses normal?

DR. HANELIN: The sinuses seem normal.

DR. COGAN: As Dr. White says, the symptoms and findings pinpoint the lesion immediately behind the apex of the orbit on the right. The combination of third-nerve paralysis, optic-nerve involvement and trigeminal-nerve involvement does not leave much doubt about the localization.

Dr. White asked whether pressure upward on the optic nerve against the roof of the optic foramen could cause primarily a lower-field defect. It has been claimed that that is true, and I understand that a partial transection of the optic nerve by a tumor growing from beneath and pushing it upward is seen not infrequently at autopsy. In the few patients I have seen with this lesion, the field defect has always been where one would expect from direct involvement of the nerve.

DR. WHITE: With dislocation of the optic nerve upward I suppose that downward grooving by the anterior cerebral artery — as is seen with some of the pituitary tumors — would be another possibility.

DR. COGAN: I do not think that there is anything that I can add to Dr. White's discussion of the type of the lesion. Among the four tumors that produce this combination of optic-nerve involvement and ophthalmoplegia is meningioma, which also frequently causes a lower-field defect initially, but the course as well as the lack of corroboratory x-ray evidence is against that diagnosis. Another possibility is nasopharyngeal tumor, but there were no symptoms of this; specifically, there were no nosebleeds and nothing to call attention to the nose. Glioma of the frontal lobe can also produce this picture, but there were no mental changes to go along with that. I had come to the independent conclusion, before Dr. White suggested it, that metastatic carcinoma was the most likely diagnosis.

DR. J. F. CHISHOLM: I am puzzled by the lack of evidence of papilledema. It seems to me that if

the patient had a cerebrospinal-fluid pressure equivalent to 500 mm. of water, she should have had some papilledema over a period. I understood Dr. White to say that if the increase in pressure is slow over several days, papilledema develops. I very recently heard of a man who dropped dead within about twenty-four hours of a rupture of an aneurysm and who in that time had not only bilateral papilledema but also bilateral retinal separation.

DR. WHITE: Papilledema does occur with aneurysm because the blood infiltrates down the subarachnoid sheath; hemorrhages and papilledema often occur within forty-eight hours of the rupture, but a tumor takes over a week to produce papilledema.

DR. CHISHOLM: Even with pressure as high as this?

DR. WHITE: Yes; I think so.

DR. WILLIAM H. SWEET: I should like to ask Dr. Cogan and Dr. White if notching of the superior aspect of the optic nerve by the anterior cerebral artery might be a more likely explanation for the defect in the lower visual field. At that point the nerve is not surrounded by the dura as it is in the optic foramen so that it does not have the benefit of the protection of this very tough tissue. If I remember correctly Kernohan[4] has shown in post-mortem material a tiny groove corresponding to the anterior cerebral artery on the superior part of the optic nerve as it enters the chiasm.

DR. WHITE: Yes; he has, and Dr. Oscar Hirsch[5] has pointed that out to us too. I mentioned that in connection with Dr. Cogan's discussion. The anterior cerebral artery crosses over the optic nerve close to the chiasm; if the lesion had been there, one might expect a visual-field defect of the type seen with a pituitary lesion.

DR. COGAN: Does Dr. White have any explanation for the lymphocytes?

DR. WHITE: I thought they might be tumor cells mistaken for lymphocytes.

DR. COGAN: Dr. Charles S. Kubik had a patient some years ago with lymphocytes in the cerebrospinal fluid and involvement of the optic nerve; that patient had an ectopic pinealoma.

DR. JACOB LERMAN: I suppose that the age rules out pinealoma.

DR. RAYMOND D. ADAMS: A lymphocytic pleocytosis in the cerebrospinal fluid is a not infrequent occurrence in cases of glioma of the brain; it may also occur with carcinoma.

DR. BENJAMIN CASTLEMAN: The necrosis of tumor of any type might stimulate a reaction with the production of lymphocytes, and if it reached the surface the cells might be found in the spinal fluid.

CLINICAL DIAGNOSIS

Space-occupying lesion of right cerebral hemisphere, ?tumor, ?aneurysm.

DR. JAMES C. WHITE'S DIAGNOSES

Brain tumor, ?metastatic carcinoma, with compression of optic and oculomotor nerves and involvement of internal capsule.

?Obstructive hydrocephalus.

ANATOMICAL DIAGNOSIS

Glioblastoma multiforme, of optic chiasm and of corpus callosum.

PATHOLOGICAL DISCUSSION

DR. CASTLEMAN: At autopsy the important findings were in the brain. I shall ask Dr. Hakim to discuss them.

DR. SALOMON HAKIM: Both cerebral hemispheres showed flattening of the convolutions. A tumor mass

FIGURE 3. *Photograph of the Tumor of the Optic Chiasm in Situ, with the Frontal Lobes Reflected Upward from the Skull.*

A=*frontal lobes;* B=*tumor;* C=*left optic nerve; and* D=*lesser sphenoid wings.*

occupied the right cavernous sinus and pituitary fossa (Fig. 3). This tumor had spread anteriorly over the medial third of the sphenoid ridge and invaded the dura and the bone. The right olfactory nerve, especially its posterior half, was embedded within the tumor. The tumor extended backward and surrounded the middle cerebral vessels to the point of its bifurcation. Superiorly, it indented the brain in the right anterior perforated substance. After cutting the middle cerebral vessels, we were able to separate the tumor from the brain on the right side, but on the

left side it was adherent and appeared to be infiltrative. The tumor involved the dura, the right sphenoid ridge, the right cavernous sinus, the entire pituitary fossa as it crossed toward the left side in the midline, and the anterior right tip of the petrous portion of the tentorium. Other structures that the tumor involved, as Dr. White and Dr. Cogan predicted, were the third nerve as it went through the cavernous sinus, the fourth nerve, which was swollen, and the branches of the fifth nerve. The tuberous cinereum, the dorsum sellae, the chiasm and right optic nerve were lost in the tumor mass. The only structures that remained free were the left internal carotid artery and the left optic nerve. Section of the brain after it was fixed revealed another tumor mass in the middle of the

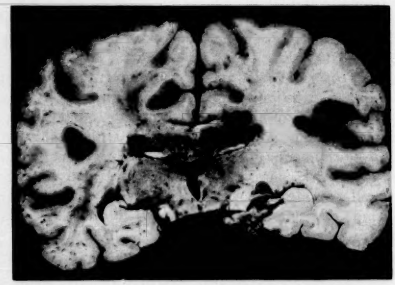

FIGURE 4. *Coronal Section of the Brain, Showing the Tumor of the Corpus Callosum.*

corpus callosum near the splenium that distorted the structures in that region (Fig. 4). There was no connection between the two tumors.

Microscopical studies disclosed a tumor that had the tendency to invade the subarachnoid and perivascular spaces and dura mater and to destroy the pituitary gland by pressure. It was composed of cells with fusiform nuclei, which varied in size and shape, many multinucleated cells and mitoses, and cells with very little stroma. Where the tumor invaded the dura the nuclei of the cells stained deeper, and the cytoarchitecture of the tumor was somewhat changed and had the appearance of fibrosarcoma. The histologic appearance of the tumor in the corpus callosum was identical to that of the one in the cavernous sinus and pituitary fossa. The different stains and microscopical preparations of this tumor revealed a histologic picture consistent with a glioma of the optic structures, with the tendency to invade the non-neurological tissues.

From the clinical picture, it seems that the tumor started in the right optic nerve, ruptured and invaded the sphenoidal space and the perivascular space. Were there two different tumors evolving at the same time, — one in the corpus callosum and one in the optic nerve, — or was there spread or implant from one tumor? I do not know the answer to that question. I should like to ask Dr. Adams to comment on that.

DR. ADAMS: The tumor was of the type that I should classify as a glioblastoma multiforme. It gave us some difficulty, however, for the reason that when any glioma invades the meninges it is likely to produce a pronounced fibroblastic reaction. When I saw that part of the tumor I was almost sure that it was a sarcoma, because the tumor cells were embedded in a scirrhous matrix. Other parts of the tumor, however, revealed the characteristic histologic features of glioblastoma multiforme. The second point of interest is that here is another example of a "double glioma." There was no visible connection between the tumor at the base of the brain and the one in the corpus callosum. Furthermore, no bridge between the two was found microscopically. Conceivably, there may have been spread from the large basal tumor to the corpus callosum along the cerebrospinal-fluid pathways. There are enough cases in which a tumor seems to have arisen in two or several different foci in the brain at or near the same time to incline one to the interpretation that some gliomas arise from multicentric foci of neoplasia. The third point is that the pituitary fossa was invaded by the tumor and the greater part of the pituitary gland was destroyed by pressure and ischemia. The lesion here resembled infarct necrosis. Was there hemorrhage there, too?

DR. CASTLEMAN: No.

DR. ADAMS: Glioma in the basal part of the brain, with extension into the sella turcica, is to be regarded as another cause of pituitary apoplexy. We have already observed it with pituitary tumors and rarely with an aneurysm that extended into the sella. Also, we have seen an infarction of the entire pituitary gland in cavernous-sinus thrombophlebitis. All these types of pituitary apoplexy must be added to the postpartum apoplexy that often causes the panhypopituitarism syndrome.

DR. WHITE: It is unfortunate that the electrolyte studies were done on the second admission rather than on the first; then we might have had a sporting chance to have made the diagnosis. The patient was hospitalized for four days; she could have had an arsenic scan; then we should have known that she had a tumor. If the electrolyte studies had revealed a sodium of 120 milliequiv. per liter and the chloride was likewise reduced, we might have more nearly approached the actual diagnosis.

DR. COGAN: What was the clinical diagnosis on the first admission?

DR. CASTLEMAN: On the first admission it was an aneurysm; on the second it was a glioma. Dr. Ballantine saw the patient just before she died and was quite certain that she had a space-occupying tumor.

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CASE 42082

Presentation of Case

A seventy-seven-year-old woman entered the hospital because of constipation.

About six months previously the patient noted onset of intermittent constipation that was relieved by laxatives. Several weeks before entry the constipation increased, requiring more frequent use of laxatives. On the morning of the day before admission she noted severe, steady, noncrampy, progressively worsening left-lower-quadrant pain that radiated to the lower middle portion of the abdomen and left side of the back and was not relieved by a liquid bowel movement or an enema. She became nauseated and vomited a small amount of recently ingested soup. Subsequently, increasing abdominal distention beginning over the lower abdomen and dysuria were noted. On the day of admission the pain diminished to a "discomfort." She passed gas by rectum. There was no history of jaundice, melena or postmenopausal vaginal bleeding.

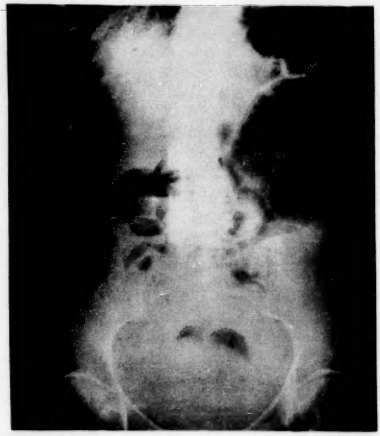

Figure 1. *Film of the Abdomen Taken in the Upright Position, Showing a Poorly Defined Density of the Bony Pelvis Extending Upward into the Right Lower Portion of the Abdomen.*

There are dilated loops of small bowel, with fluid levels.

Physical examination showed an elderly woman in no acute distress. The heart was not enlarged. A harsh, Grade 3, apical systolic murmur and a Grade 2 systolic murmur at the base, which was transmitted to the neck, were heard. Examination of the lungs was negative. The abdomen was distended and tympanitic, with diffuse tenderness but without rebound tenderness. There was no fluid wave. Increased peristaltic activity was noted, but no tinkling sounds or peristaltic rushes were audible. In the middle portion of the abdomen just below the umbilicus there was a smooth, nontender, movable mass measuring 15 cm. by 10 cm. Pelvic and rectal examinations were negative. There was slight pitting edema of the ankles.

The temperature was 98.4°F., the pulse 100, and the respirations 18. The blood pressure was 150 systolic, 70 diastolic.

The urine gave a + test for albumin; the sediment contained 3 white cells and an occasional hyaline cast per high-power field. Examination of the blood showed a hemoglobin of 10.3 gm. per 100 ml., and a white-cell count of 13,600, with 81 per cent neutrophils. X-ray examination of the abdomen demonstrated considerable gas in many loops of small intestine, with moderate distention in one C-shaped loop in the middle portion (Fig. 1). Very little gas was noted in the colon. There appeared to be some fluid in the peritoneal space.

An operation was performed four hours after admission.

Differential Diagnosis

Dr. George L. Nardi*: Was the patient Russian, Ukrainian or Scandinavian?

Dr. Claude E. Welch: She was a Yankee.

Dr. Nardi: Did she have a barium-enema examination, a guaiac test of the stool or sigmoidoscopy?

Dr. Welch: She had none of them. The rectum was completely empty on digital examination.

Dr. Nardi: May I see the x-ray films?

Dr. Joseph Hanelin: We do not have both the films that were taken of the abdomen. The single film with the patient in the upright position gives evidence of gas in the bowel, apparently principally in the small intestine, with some dilatation of the small-bowel loops (Fig. 1). I am not certain how much of the gas is in the transverse colon, but some is present. There is no air that I can identify in the rectum or descending colon. There are fluid levels, both on the right and in the middle portion, which are probably in the small bowel. Over the pelvis and over the abdomen there is a diffuse increase in density, which we sometimes see when the patient is in the erect position, but it does suggest that free fluid is present. I do not know how much of this density

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represents the palpable mass, but I cannot identify the edge of the mass. In the other film it was perhaps easy to see the single C-shaped loop of bowel that was more distended than the remainder, but I cannot be sure which it is from this film.

DR. NARDI: Is this the loop?

DR. HANELIN: It is difficult to see on this film. What is important to know is whether it was fixed in position, when the patient was both lying down and standing up.

DR. BENJAMIN CASTLEMAN: Do you know the answer to that, Dr. Welch?

DR. WELCH: No; I do not.

DR. NARDI: Would you commit yourself about whether it is small or large bowel?

DR. HANELIN: It is probably small bowel, since it contains no haustra, although occasionally, as you know, we can see virtually no haustral marks in the colon.

DR. NARDI: This seventy-seven-year-old woman had a history of constipation for six months, which gradually became worse; then abdominal pain suddenly developed, and a mass was palpable on physical examination. The sudden onset of pain and tenderness suggests local leakage as a result of either perforation of a tumor or diverticulitis with formation of an abscess. The smooth, nontender, movable mass, 15 by 10 cm., does not fit, however. I do not believe an abscess or even a neoplasm could assume this size and be freely movable, although it is conceivable that a large neoplasm in the transverse colon could be balloted.

The next most likely diagnosis is a volvulus; however, the history is so typical of a volvulus that I am suspicious. The reason I asked what the nationality was is that Russian and Scandinavian people are said to have much longer mesocolons, in the ratio of 4 to 1 on the basis of autopsy studies. This has been explained by the vegetable diet and long periods of fasting and overeating, which are supposed to predispose to the development of an anatomically long mesocolon. If this was a volvulus, with the palpable mass representing a closed loop of bowel that had turned around on itself, what was its origin — sigmoid, cecum or small bowel? The frequency is in that order. It has been our experience that if the large distended gas pattern is in the right lower quadrant, the volvulus is usually of the sigmoid, whereas if it is in the left lower quadrant, the volvulus is of the cecum or ascending colon.

Another possibility is that a mesenteric cyst accounted for the palpable mass, which was freely movable and nontender. Such a cyst may have caused a volvulus of the large or small bowel with small-bowel obstruction. In view of the normal temperature and white-cell count, I do not believe that, if the patient had a volvulus, it was necrotic or gangrenous. Apparently, the operation was performed four hours after admission so that the physician caring for her may have thought that there was an abdominal emergency. From a pragmatic point of view the important decision to make is whether or not she should have been operated on. The diagnosis I should make is volvulus of the large bowel, probably of the sigmoid.

DR. JOHN T. QUINBY: Is there any reason why a volvulus should occur at the age of seventy-seven without previous intestinal symptoms?

DR. NARDI: This is a good history for volvulus — these periods of intermittent constipation, perhaps relieved by laxatives, are fairly common for people with volvulus. I do not know how it could be proved. It is believed that there are frequent torsions and detorsions and that the acute episode is the torsion that does not untwist. I do not think it is incompatible with a history of volvulus. Volvulus is more common in middle-aged and old persons.

DR. QUINBY: Is it more common in those who have a peritoneal operation with adhesive bands of fibrous tissue?

DR. NARDI: I think it would be less common in someone who had had adhesions, because the adherent bowel would have less chance to twist on itself.

DR. JOHN DENOVIAN: Is there anything against diverticulitis?

DR. NARDI: No; my first impression was diverticulitis or carcinoma. The history sounded typical of the elderly person with a carcinoma of the large bowel and obstruction. I cannot reconcile either of those two diagnoses with the physical findings of a freely movable mass unless I assume that the mass was a mesenteric cyst, completely unrelated to the other condition. I have chosen to make one diagnosis.

DR. CASTLEMAN: Do you think that the mass felt was a volvulus without air in it?

DR. NARDI: Probably.

DR. HANELIN: That is exceedingly rare. (I wish we had the other film.) This is not the classic x-ray picture of sigmoid volvulus, nor does it look like a cecal volvulus.

DR. WELCH: There was no significant difference in the other film.

DR. CASTLEMAN: If this volvulus of the sigmoid or cecum was the mass that was felt it should be a gas-filled loop. Is it ever seen without gas?

DR. HANELIN: I have never seen it.

DR. NARDI: The question comes up whether or not the patient had a twisted ovarian cyst. The protocol is emphatic about the fact that the rectal and pelvic examinations were negative. I therefore ruled out pelvic disorders.

DR. CASTLEMAN: I will give you another chance since the radiologist believes quite firmly that this could not be volvulus.

DR. NARDI: He is undoubtedly right, but I am afraid that I have to stick by my diagnosis. Other diagnoses, such as peritonitis and mesenteric throm-

bosis, have to be considered, but they do not seem to fit the findings.

DR. CASTLEMAN: Does anyone want to offer another diagnosis? Dr. Ballantine, you used to operate on the abdomen.

DR. H. THOMAS BALLANTINE: I am delighted that you consider me still a surgeon, but that is no longer my locality! It is difficult for a neurosurgeon to improve on the diagnosis given by Dr. Nardi, but I am bewildered by the ground-glass appearance in the pelvis on the x-ray film. Does that represent a mass in its entirety, or is a mass obscured by the overlying fluid perhaps in the lower abdomen, since this film was taken with the patient upright?

DR. HANELIN: I simply cannot define a mass. I do not know how much of the ground-glass appearance is the result of fluid and how much the result of mass.

DR. BALLANTINE: The mass was described as 15 by 10 cm. in diameter. The density in the pelvis is greater than one would expect with a mass of that size. Dr. Welch, did the mass occupy the entire lower abdomen or only a small portion of it on physical examination?

DR. WELCH: The suprapubic area was occupied by the mass.

DR. HANELIN: What we see may represent a good portion of the mass that was felt.

DR. BALLANTINE: I wonder whether the patient had a twisted ovarian cyst, regardless of the negative pelvic and rectal examinations, with secondary gastrointestinal symptoms.

DR. CASTLEMAN: Dr. Welch, will you tell us what you believed the patient had before operation and then tell us your operative findings?

DR. WELCH: When Dr. Nardi said that he was going to choose the most simple condition I thought he was going to be ungentlemanly and ask if the patient had been catheterized before the operation. We have seen a large bladder that produced almost the same picture.

This diagnosis was not difficult until the niceties of diagnostic methods were employed. As soon as we saw the x-ray films we became confused. By physical examination this should have been a suprapubic mass that was a high-riding ovarian cyst, entirely outside the pelvis. The x-ray report brought out the other possibility: that this was a mass of strangulated small bowel, with volvulus. This picture certainly was not typical of volvulus of any portion of the large bowel where gas shadows become prominent. The typical x-ray picture of volvulus of the ileum, however, consists of distention of the intestine above the lesion, and very little gas in the fluid-filled mass. The x-ray diagnosis was strangulated small bowel; the clinical diagnosis before operation was twisted ovarian cyst.

CLINICAL DIAGNOSIS

?Twisted ovarian cyst.
?Strangulated small bowel.

DR. GEORGE L. NARDI'S DIAGNOSIS

Volvulus of large bowel.

ANATOMICAL DIAGNOSIS

Twisted ovarian cyst.

PATHOLOGICAL DISCUSSION

DR. WELCH: As Dr. Ballantine suggested, it was a twisted ovarian cyst, which was gangrenous throughout. There was free blood in the peritoneal cavity, accounting for the fact that the mass was not clearly outlined on the films. The small intestine and colon were moderately dilated but not obstructed.

DR. CASTLEMAN: Was this small-bowel ileus?

DR. WELCH: Yes.

DR. CASTLEMAN: You did not feel the ovarian cyst from below?

DR. WELCH: It was so large it was completely out of the pelvis.

DR. CASTLEMAN: The specimen showed that the tube as well as the cyst had twisted; both were gangrenous. We could not make a diagnosis microscopically because the tissue was too gangrenous, but it probably was a simple cyst originally. There was no evidence of a malignant neoplasm.

ANNOUNCEMENT FOR GROUPS USING CASE RECORDS

Pertinent 35-mm. lantern slides of x-ray films, gross specimens and microscopical slides to be sent along with the current Case Records each week will again be available for the year beginning March 1, 1956.

Applications for this service (fee, $100.00 a year) may be obtained from Dr. Benjamin Castleman, Massachusetts General Hospital, Boston 14.

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HAROLD RICHARD KURTH

IT is with sincere regret that the *Journal* records the sudden death on February 7 of Dr. Harold R. Kurth, of Lawrence, president elect of the Massachusetts Medical Society.

Dr. Kurth had been for many years a devoted worker in the interests of the parent society and of his district, and his selection for the office that in three months would have elevated him to the presidency was universally approved.

MEETING OF THE COUNCIL

THE stated midwinter meeting of the Council of the Massachusetts Medical Society was held at the Boston Medical Library on February 1, 1956. The usual interim appointments of the President were approved. The Pharmacy Act, which became effective January 1, was discussed in a consideration of the report of the Committee on State Legislation. Under this law, if literally interpreted, any physician may be heavily fined or incarcerated for an appreciable portion of his life span, or both, for dispensing a few aspirin tablets to a patient. Assurance has come from the Division of Food and Drugs of the Massachusetts Department of Public Health, charged with enforcing the law, that no oppressive actions are contemplated. Failure to designate certain drugs as harmful is considered to be one of the defects of the law as enacted, although there is some question whether such an arbitrary definition should be allowed to constitute a legal distinction. On this basis an amending bill has been introduced as a compromise that will, if accepted, at least ameliorate the threat to the physician.

The Panel on Cancer of the Committee on Public Health was authorized to study cases of unorthodox therapy in the field of cancer and recommend action by the appropriate committee. This authorization was requested and granted in view of the known charlatanry that exists in relation to the treatment of this disease.

After long and at times inspired debate the original request for an appropriation of $15,000 for the Postgraduate Medical Institute was approved. Under new business, and with the hearty approval of the Committee on Postgraduate Education, the President was authorized to appoint a committee to evaluate the technic, scope and cost of the program of postgraduate medical education.

Much debate was given over to the constitution of the Committee on Hospital and Professional Relations, a resolution having been presented to the Executive Committee from the Norfolk District Society and referred to the Committee on By-Laws and Council Rules, that this committee be made a standing committee with one member from each district making up its personnel. It was finally voted that no change be made.

A federal bill providing for the care of dependents of military personnel through the purchase of civilian services under an insurance plan similar to the home-town insurance program, as approved by the American Medical Association, was approved by the Council.

A resolution regarding the proposed levy of $10 to be assessed on the members of all state medical societies for payment to the American Medical Education Foundation was referred to the Committee on Finance after a minimum of discussion. As further new business, under suspension of rules, a request of the Worcester Chapter of the American Red Cross to the parent organization was approved. This request is for the setting up of an independent blood bank and collecting unit in Worcester, which, it is expected, would result in an increase in blood collection from 8000 to 12,000 pints. The desirability of having more than one center in the State constituted a telling argument.

EXPERT OR SPECIALIST

THE dictionary, and until recently common usage, has defined a "specialist" as one who restricts his activities to certain areas of medical practice or to certain diseases. Thus, a man may be a specialist in pathology or bacteriology whether or not he is a physician; a woman may be a specialist in the removal of superfluous hair by electricity without any formal training or degree; or a chiropodist may specialize in treating corns.

Quite different is the significance of the term "expert." As used in the courts, an expert witness is one who has special training or knowledge in a given field, and it is customary to request that an expert witness qualify himself in court by describing his training, qualifications and accomplishments to the satisfaction of judge and jury.

Since the establishment of the various American specialty boards, the listing of their certificate holders, and the publication of a *Directory of American Specialists*, confusion has arisen. The *Directory* contains a large (but by no means comprehensive) list of qualified specialists, many of whom no doubt are also experts. The layman may be excused if he consults such a source to determine whether or not a given physician is a "qualified specialist." Physicians know, however, that such a listing is no guaranty of specialization in actual practice and, more important, that the absence of a physician's or surgeon's name from the list does not prove him to be a general practitioner.

One practically important result is that governmental agencies authorized to pay higher fees to specialists than to general practitioners may hesitate to accept the services of a specialist at standard rates if his name does not appear in the *Directory*. Everyone is acquainted with outstanding "specialists" of great skill who are not certified by the board concerned. They may or may not be specialists in the dictionary sense, but they are unquestionably experts who for one reason or another have never qualified themselves for certification.

No directory of experts exists. The *Directory of American Specialists* is perhaps a partial or incomplete list of experts, but even here there may be some difference of opinion about whether mere formal compliance with certain standards of training and practice makes a man a true expert.

The boards might consider abandoning the use of the word "specialist" and adopting some other term. They should perhaps be known as American qualification boards and their directory as the *Directory of Qualified Experts*.

A man who specializes in rectal diseases may be a qualified expert in rectal surgery, or he may be an ignorant quack. A better term than "specialist" is needed to identify the expert.

THE MET. ON MORTALITY, MATRIMONY AND MOTORCYCLES

THE Information Service of the Metropolitan Life Insurance Company, in a series of releases prepared last fall by its corps of still unwearied statisticians, presents a variety of facts on matters pertaining to life and its grim antonym.

On the positive side are data relevant to general mortality rates and to specifications of the typical American wife as represented by "a statistical profile . . . sketched largely from data from the Bureau of the Census." On the negative side are figures relating to motorcycle accidents, which account for approximately a thousand deaths each year in the United States.

The prevailing mortality among Americans from middle life on, according to this source of information, has dropped appreciably in the last two decades. Thus, among the Company's industrial policyholders, the death rate for white men forty-five to seventy-four years old fell from 29.9 per 1000 in 1935 to 22.5 in 1954, or 25 per cent. On the distaff side the figures are even more favorable, the decline being from 21.6 to 12.2 per 1000 — a matter of almost 45 per cent.

The improvement is not unexpectedly greater in the forty-five to fifty-four-year-old decade than in later life and is reflected especially in the infectious diseases although the mortality from disorders of the heart and kidney has also fallen. With no claim that health insurance, so-called, is a factor, the Service records a 30 per cent drop in the mortality from cardiorenal afflictions among insured women from forty-five to seventy-four years of age. Less con-

spicuous has been a drop of 5 per cent for men fifty-five to sixty-four years of age, and of 16 per cent for those sixty-five to seventy-four years old. In the thirty years from middle age to a robust senescence the mortality from cancer has decreased one sixth among women but has risen among their mates on account of a "sharp upward trend" in the recorded deaths from respiratory cancer. There has been considerable improvement in the death rate from accidents.

From the uxorial angle it appears that the typical American housewife, of whom there are currently some 40,000,000 in operation, — an increase of 9,750,000 in fifteen years, — is relatively young, inhabits her own home in an urban area and is busily engaged in the process of yeaning and raising the products thereof. Forty per cent of her number are under thirty-five years old, an additional 25 per cent are from thirty-five to forty-four, and about 50 per cent have become married since 1940. Only 6 per cent of American housewives live apart from their husbands, and these not necessarily from dissatisfaction with connubial bliss, but mainly because of the husband's absence in line of duty, gainfully employed or in the armed forces — a not too subtle distinction. Twenty-two per cent of the wives are themselves employed; the life insurance on the total group is over $50,000,000,000 and rising rapidly.

Of the thousand motorcycle fatalities, 800 are those of cyclists or their passengers, the remaining victims having been pedestrians or occupants of other vehicles, including pedal-driven two-wheelers. The Metropolitan statisticians conclude with the sage observation that this mortality could be greatly reduced if motorcyclists exercised more caution against traffic hazards and hazardous road conditions; that "motorcycles when properly used can be a safe and efficient means of transportation."

ANOTHER MASSACHUSETTS FIRST

On January 1, 1956, some 32,000 employees of the Commonwealth and their dependents — about 75,000 persons in all — became the beneficiaries of a de luxe package of Blue Cross–Blue Shield benefits consisting of Blue Shield Plan B, with its new diagnostic rider, Blue Cross, with a $14 room and board allowance, and the Blue Cross–Blue Shield Prolonged Illness Certificate. In addition employees became eligible for life and dismemberment insurance.

Under the first law enacted by any state to provide fringe benefits for state employees, the Commonwealth pays 50 per cent of the total cost for each employee. Because of this participation, the program is under the immediate direction of a commission made up of 2 members of the Legislature, 1 employee representative, the Commissioner of Insurance and the Commissioner of Administration and Finance.

As is customary in governmental operations, the Commission prepared specifications and asked for bids. On the basis of these bids the Boston Mutual Life Insurance Company, reinsured by a number of other Massachusetts companies, was awarded the life and dismemberment insurance, and Blue Cross–Blue Shield the insurance for medical and hospital care.

The Governor and the members of the Legislature are to be congratulated for making Massachusetts the first state to provide fringe benefits for its employees, the Commission for diligently seeking and obtaining the best possible coverage at the lowest possible price, Boston Mutual and the other Massachusetts insurance companies for their successful bids, Massachusetts Blue Cross and Blue Shield for having again demonstrated their superiority in the health-insurance field and, last but not least, the employees of the Commonwealth and their dependents for being the beneficiaries of such an excellent program.

FAULKNER UNVEILED

The above cut shows Dr. James M. Faulkner, former dean of Boston University School of Medicine, being unveiled by his sons Andrew and Henry in a recent ceremony. The portrait, by William Draper, was presented to the School by Dr. Faulkner's loyal associates.

Although it is not always in the interest of good family relations for sons to expose their father, the method employed by Andrew and Henry seems to be a particularly gracious one.

The Winter in Philadelphia *is remarkable for the severity of the cold, and the amount of snow fallen . . . The smallpox and varioloid have been prevalent all over the city, and considerable alarm has existed on account of it.* — Philad. Med. and Surg. Journal.

Boston M. & S. J., *February 28, 1856*

MASSACHUSETTS MEDICAL SOCIETY

TREASURER'S OFFICE

This year the Committee on Finance has voted to distribute $6,000 to the district societies toward defraying their operating expenses from the surplus in the General Fund at the end of 1955.

Members are reminded that the percentage of this sum that is allocated to their own district is determined by the number of dues from that district paid by March 1, 1956. Members who have not paid their dues by this date are automatically removed from the mailing list of the *Journal* until such dues are paid.

ELIOT HUBBARD, JR.
Treasurer

COMMITTEE ON MATERNAL WELFARE

PUERPERAL SEPSIS

A twenty-three-year-old primigravida with severe diabetes died on the eighth day after a cesarean section.

Diabetic since the age of eight, she had always received meticulous and expert treatment. During pregnancy she was given daily intramuscular injections of progesterone-estradiol mixture supplemented by stilbestrol by mouth on a steadily increased dosage schedule. No hypertension or albuminuria developed, but minimal peripheral edema and hydramnios occurred toward the end of pregnancy.

At thirty-five weeks, after two weeks in the hospital primarily for fluid and diabetes control, elective cesarean section was performed because of the severe diabetes, hydramnios, breech presentation, and a falling pregnanediol.

During administration of the spinal anesthetic, a draining abscess of the left gluteal region was seen, apparently the site of a hormone injection. However, the operation was performed without event, and a healthy male infant weighing 2.9 kg. (6 pounds, 5½ ounces) was delivered. (He has continued to thrive ever since.)

The postoperative course was complicated by distention, which developed on the first day and was resistant to all measures, including tubation with various suction devices that never passed the pylorus.

A febrile response, with attendant difficulties of diabetes control ensued, further complicated on the fourth day by a urinary infection due to *Escherichia coli*. Sensitivity tests showed inhibition of growth by oxytetracycline and chloramphenicol. The former was therefore given in adequate dosage.

Distention persisted despite peristalsis and some flatus, but intubation failed. Vigorous supportive measures, including skillful electrolyte control and transfusions, were given, but the patient continued to fail. Foul lochia was noticed on the sixth day. On the next day the Miller–Abbott tube finally entered the small bowel, and the distention improved; however, clinically the patient's condition became worse, and she died the next day despite the addition of chloramphenicol to the regimen.

Autopsy disclosed that the cause of death was puerperal sepsis, with multiple abscesses in the uterus, extension to the parametrium and multiple septic emboli and miliary abscesses in the lungs, heart, kidneys and ovary. There was a massive purulent peritonitis producing 1000 ml. of purulent fluid. A nonhemolytic *Staphylococcus albus* was recovered from the heart's blood, the kidney pelvis and the peritoneum, where it was admixed with some *Esch. coli*. The organism was sensitive to chloramphenicol but not to oxytetracycline.

In the opinion of observers, the portal of entry was the gluteal abscess at the sites of hormone injection. This abscess ruptured on the day of hysterotomy, presumably with a transient invasion of the blood stream by bacteria, which then found the degenerating decidua and uterine incision a fertile field for nourishment, growth and spread. Although *Staph. albus* is not usually pathogenic, it can be so in diabetes.

Further comment seems hardly necessary. Despite the tragic fact that the only drug that might have corrected the infection and saved the patient's life — namely, chloramphenicol — was withheld until too late through failure to recognize the responsible organism, the case was classified as a nonpreventable death.

JOHN FIGGIS JEWETT, M.D.
Chairman

BLUE CROSS–BLUE SHIELD

BLUE SHIELD FEE COMMITTEE

On October 5, 1955, after consultation with the General Chairman of the Blue Shield Fee Committee Chairmen, who is elected annually by the Massachusetts Medical Society and who currently is Dr. Richard Sweet, the Blue Shield Central Professional Service Committee voted as follows:

1. That there shall be a single Blue Shield Fee Committee composed of one representative of each of the following specialties:

Anesthesiology	Obstetrics and Gynecology
Pediatric Surgery	Otolaryngology
Plastic Surgery	General Surgery
Urology	Oral Surgery
Radiology	Internal Medicine
Ophthalmology	Dermatology
Thoracic Surgery	Pathology
Neurosurgery	Pediatrics
Proctology	Psychiatry
Orthopedics	General Practice

2. That the General Chairman of the Blue Shield Fee Committee Chairmen, who is elected annually by the Massachusetts Medical Society, shall, following his election each year, designate the members of the Blue Shield Fee Committee except that where any specialty is represented in Massachusetts by an organized society, he may waive his right to designate the representative and request the society to do so.

TABLE 1. *Specialties and Locations.*

SPECIALTY	REPRESENTATIVE	LOCATION
Anesthesiology*	Leo V. Hand, M.D.	Newton Highlands
Dermatology	Bernard Appel, M.D.	Lynn
General Practice*	Daniel Rogers, M.D.	Wenham
General Surgery	Donald R. Hayes, M.D.	Springfield
Internal Medicine	L. Tillman McDaniel, M.D.	Brookline
Neurosurgery	H. Thomas Ballantine, Jr., M.D.	Boston
Obstetrics and Gynecology*	Roy J. Heffernan, M.D.	Brookline
Ophthalmology*	Garrett L. Sullivan, M.D.	Boston
Oral Surgery*	Walter C. Guralnick, D.M.D.	Boston
Orthopedic Surgery	Charles H. Bradford, M.D.	Boston
Otolaryngology*	Charles H. Allman, M.D.	Boston
Pathology	Morris W. Shapiro, M.D.	Boston
Pediatrics*	Edward C. Dyer, M.D.	Brookline
Pediatric Surgery	Henry W. Hudson, Jr., M.D.	Brookline
Plastic Surgery	Bradford Cannon, M.D.	Boston
Psychiatry	Robert Fleming, M.D.	Boston
Proctology	E. Parker Hayden, M.D.	Boston
Radiology*	Max Ritvo, M.D.	Boston
Thoracic Surgery	John W. Strieder, M.D.	Brookline
Urology	Edwin L. Prien, M.D.	Brookline

*Nominated by specialty society.

3. That nothing in the foregoing shall preclude any organized society or any group of specialists from establishing a fee committee to consult with and advise their representative on the Blue Shield Fee Committee.

On October 16, 1955, Dr. Sweet asked the eight specialty societies in Massachusetts to designate their representatives on the Committee. At the same time he requested the members of the Blue Shield District Professional Service Committees to nominate candidates for the remaining twelve positions. As a result of these actions the Committee shown in Table 1 has been constituted.

CORRESPONDENCE

"FAIR TRADE"

To the Editor: In the December 22, 1955, issue of the *Journal* my attention was called to an editorial, "Trustee-Staff Relations," referring to a letter, "Trustees versus Staff," in the same issue. The letter is provocative, for I am beginning to think that the caption might also read "Staff versus Trustees."

To be sure, we all like to run our own house, — namely, to set our policies, — but a hospital is an integrated institution and the medical staff is only a part of the entire organization. Medical bylaws are intended to regulate the staff best to serve the hospital and in turn the public; too frequently our bylaws best serve a few dominating individuals and thereby fail in their purpose. Certainly, a board of trustees is able to eliminate the restraints on "fair trade" in the medical bylaws without actually writing them. This is the administrative responsibility of the trustees, and they would then be accomplishing their goal as well as promoting unity and harmony in the medical staff.

E. M. SICKEL, M.D.

Lakewood, New Jersey

ANATOMY OF GASTRONOMY

To the Editor: "A Rose by Any Name" may smell the same, but when the subject under discussion is sweetbread, as in the editorial in the November 10, 1955, issue of the *Journal*, it will not look or taste the same. Since this is a subject that has frequently been under discussion in my experience as a housewife as well as an M.D., I offer the benefit of my research on this problem.

I once was fortunate in having an unusually well informed butcher who knew meat from the killing floor to the table. When not busy he permitted me to go behind the counter, where we spent considerable time "anatomizing" various cuts. Once, after a dinner at which sweetbreads had been served and the discussion of their origin had become the chief topic of conversation, I took it up with my butcher friend. He did not know the organ names, but by description and demonstration of specimens there could be no doubt about the accuracy of the findings.

Sweetbread is properly either thyroid or thymus of a calf. Pancreas, though sometimes sold as "stomach" sweetbread, is a very inferior item. Also, glands from older animals have a high proportion of connective tissue.

The thyroid is called the neck sweetbread. It lies in the neck on either side of the trachea with a connecting isthmus across the upper portion. It is large, distinctly lobulated and of such a characteristic shape that there should be no confusion concerning its identity.

The thymus is known as the heart sweetbread. It "lies under the breastbone and over the heart like a fist," to quote my friend. It is blocky and perhaps more like a palm in size and shape than a fist, except that it is thicker through the center. It is not as distinctly lobulated as the thyroid; in flavor it is as pleasant and may or may not be preferred by the cook, depending on the way it is to be served.

If the sweetbread is to be served creamed or in salad, the thyroid should be used because the lobules break apart easily. If it is to be served whole the thymus is better because, being a neat block of tissue, it holds together well and makes an attractive serving; not being as distinctly lobulated it does not come apart as readily as the thyroid. The flavor is much the same, but the consistence, as appreciated by either handling or eating, is different. (CAUTION: do not serve to your gouty friends.)

LEONA VAN GORDER GLOVER, M.D.

Cleveland Heights, Ohio

REGARDING JOINT BLOOD COUNCIL

To the Editor: The editorial, "Joint Blood Council," which appeared in the January 19 issue of the *Journal*, im-

plies that you are not enthusiastic about the composition of its membership. Although I share your lack of enthusiasm, it is for reasons different from those stated. The editorial states that only two of the represented organizations in the "Council" — the American Red Cross and the American Association of Blood Banks — are in the blood-banking field.

The American Red Cross is not in the blood-banking field in the strict sense of the term. It is only in the collecting and distributing portion of blood banking. "Blood banking" (a term that is grossly misused, because there is not even a remote similarity to a commercial bank), in its modern meaning, is a field in which blood is collected and tested and it or its derivatives are administered to human beings. The representatives who will probably know the least about blood banking are the medical directors of the Red Cross in Washington, who have neither clinical nor laboratory experience in the modern problems of blood banking and transfusions.

Representatives of the American Hospital Association are vitally interested because, when blood is collected and tested in a hospital blood bank, it costs money in terms of equipment as well as in personnel time. If the blood so collected and tested is then sent to another institution, financial consideration must be given to the collecting institution as well as the recipient. Hospital administrators must be included in the "Council."

The American Medical Association is vitally interested because blood banking is definitely a practice of medicine. Standards, ethics, improvements and safeguards are best made the responsibility of representatives of the American Medical Association. Physicians order and administer blood transfusions, and their representatives must be included.

When the American Association of Blood Banks was first organized, only one of its officers was a physician. One officer never graduated from high school; another was a businessman, and another was a lawyer.

I was present at the first business meeting to help set up a constitution for the newly formed organization. In several parts of this country, blood banking was already "big business," and very profitable. A few other physicians (practicing pathologists and blood-bank directors, as well as members of the American Society of Clinical Pathologists) were also present at this meeting and worked far into the night, trying to make this organization adhere to the best principles of the practice of medicine. Since they were few in number, every such proposal was vetoed. We retained our membership, however, attempting to elevate the American Association of Blood Banks in line with the present practice of American medicine. This organization has improved since its beginning, but it still has a long road to travel.

The majority of hospital-blood-bank directors in this country are practicing pathologists. Pathologists, like all other physicians, dislike joining more medical organizations. Hence, the nonmedical blood-bank directors, salesmen for blood-banking equipment and businessmen in the field of blood banking for profit only seized the opportunity to form the American Association of Blood Banks. Pathologists who are blood-bank directors are personally involved in the "Blood Council" together with their hospital blood banks. Members of the American Society of Clinical Pathologists are physicians, and most are blood-bank directors. This society must be represented.

My lack of optimism, however, is based on the fact that the representatives of the American Association of Blood Banks who are not physicians and have a heavy financial interest in the blood-banking field vote almost unanimously as a block and will not give up their grip in this field without a fight. They speak of their purposes in terms of the highest of ideals and ethics, but return to their business for profit only — so much so that many former physician members have resigned in disgust. The medical directors of the Red Cross Blood Program Headquarters show little interest unless they can dictate and advertise the Red Cross, and American blood banking still needs a great many things — but dictatorship, never.

From the standpoint of economy, the fact that the headquarters of the "Council" are centrally located in the United States is, of course, practical.

The last suggestion in the editorial, however — "for it [the Council] to be effective, the member associations should agree to be governed completely by its decisions and be unable to withdraw without a two-thirds vote of their membership," — is arbitrary and dictatorial. The progress and advances made by American medicine today were never achieved by arbitrary and dictatorial edicts from "headquarters." Blood banking has also advanced tremendously in this country, and what we think is best today may be tomorrow's worst. Example, research and experience will improve blood banking as they have improved medicine in general. Any method of compulsion will only be a giant step backward.

WILLIAM FREEMAN, M.D.
Pathologist and Director of Laboratories
Truesdale Hospital, Incorporated
Fall River, Massachusetts

BOOK REVIEWS

Bluthrankheiten. By Professor Dr. Hanns Fleischhacker. 8°, cloth, 247 pp., with 76 partly-colored illustrations. Vienna: Wilhelm Maudrich, 1955. $7.50. (Distributed in America by Intercontinental Medical Book Corporation, New York City.)

As stated in the author's foreword, this book is an attempt to present to practitioners and students of medicine an elementary clinical text emphasizing diagnostic and therapeutic methods of established value in diseases of the blood. These include the gamut of disorders of red cells, white cells, platelets and their precursors as well as coagulation defects. Necessarily, therefore, a book of this moderate size can in many places do little more than mention significant points, with little exposition. There is bare coverage indeed, where, apparently, the author considered the subject beyond the scope of student or general practitioner. Thus, coagulation defects are covered in less than eight pages. However, in general, if these inherent limitations are accepted, the survey is surprisingly complete and up to date. The order of presentation is logical and well subdivided by topic and typography. An area of hematology passed over too lightly in some texts, but given nearly fifteen pages here, is the blood picture in common infectious diseases. The therapy advocated is not always particularly useful — for example, the recommendation of hydrochloric acid in the treatment of pernicious anemia or of the diamidines in myeloma. The author consciously risks the subjectivity of citing no references to the literature but does mention in the text the authorship of many outstanding contributions. The colored illustrations are not first class by modern standards, but there are some excellent tables. This book provides a practical survey of a large topic but presents no information that will not be found more readily in somewhat larger American or British texts by those who do not read German with facility.

WILLIAM B. CASTLE, M.D.

Airborne Contagion and Air Hygiene: An ecological study of droplet infections. By William Firth Wells. 8°, cloth, 423 pp., with 85 illustrations and 38 tables. Cambridge: Harvard University Press, 1955. $6.00. (Published for the Commonwealth Fund.)

This book records some of the work and the thought of its author in elucidating the mechanics of contagion by atomized droplets, droplet nuclei and particles of dust. These he has studied and discussed until their behavior in ambient indoor air, with and without varying degrees of ventilation, is thoroughly understood. The infectivity of microbic life thus brought into contact with the physiologically complex passages of the respiratory tract was studied in laboratories, wards, classrooms and even business offices. Sterilization of indoor air, primarily by ultraviolet radiation, has been accomplished in these varying situations of exposure, and has been made to demonstrate its usefulness under certain circumstances. Air disinfection seems to be peculiarly adapted to protection against droplet nuclei. Contagion from this source is generally associated with *people* and with conditions of their noses and throats. Dust-borne infections, on the other hand, are more associated with *places* and therefore with the housekeeping standards by which they are maintained. Droplet infection itself is,

of course, a form of direct contact or an exceedingly small extension theory.

This growing knowledge of airborne contagion does not yet (and may never) have the direct applicability to environmental control of disease that followed the development of knowledge of water and sewage sanitation. It is recognized that other factors besides those affecting the viability and dispersion of micro-organisms in the air are involved in the patterns of airborne disease. Nevertheless, this book presents a most valuable collection of basic information on the subject.

In connection with the title it might be added that the hygiene of outdoor air has not been considered, nor have any of the airborne allergens or industrial contaminants that may affect the health of man.

DWIGHT O'HARA, M.D.

Bone and Joint X-Ray Diagnosis. By Max Ritvo, M.D. 4°, cloth, 752 pp., with 568 illustrations. Philadelphia: Lea and Febiger, 1955. $20.00.

This handsome volume, bound in a cover of particularly attractive blue, reflects the considerable experience of the author in x-ray diagnosis and in writing books. Out of his experience of more than thirty years in radiology, and from the files of the Boston City Hospital, comes the material for this authoritative treatise on the x-ray manifestations of diseases and abnormalities of the bones, joints and soft tissues. Recently acquired knowledge about the clinical and radiologic features of many new and important entities is well presented and constitutes one of the very valuable features of the book, for much of this material is not available elsewhere. Unfortunately, the author has uncritically accepted and included material that is out of date or even erroneous, such as Calvé's osteochondritis of the vertebras or apophysitis of the heel — lesions that, if they exist at all, should not be accepted as originally presented. A number of features, such as emphasis on early diagnosis of many lesions by interpretation of soft-tissue changes are indeed worth praise and warrant study by all radiologists. It is a field of x-ray interpretation that is too often neglected. All the material is clearly and understandably presented but in a staccato and verbose style. Illustrations, although adequate in number, are small and often poorly reproduced and compare most unfavorably with the excellent illustrations now available to radiologists in many of the foreign textbooks. The bibliography is limited, but reference is made to pertinent articles.

On reviewing this book one recalls the famous quotation from *Ecclesiastes* **XII** and ponders upon its place among the plethora of volumes being produced for the remuneration of the publisher and the personal satisfaction of the author. If this textbook is designed primarily for the student, it is much too expensive, and if it is for the general medical reader or radiologist, equally good or better books on the x-ray diagnosis of bone lesions are already available.

EDWARD B. D. NEUHAUSER, M.D.

Surgery of the Alimentary Tract. In 3 volumes. By Richard T. Shackelford, M.D. Assisted by Hammond J. Dugan, M.D. 4°, cloth. Vol. 1, 862 pp., with 583 illustrations; Vol. 2, 771 pp., with 441 illustrations; Vol. 3, 940 pp., with 681 illustrations. Philadelphia: W. B. Saunders Company, 1955. $60.00 per set.

This work on abdominal surgery obviously required an enormous amount of time and study on the part of the author. He has drawn on many sources, and his selection of illustrations is, on the whole, excellent. One may criticize him for including some of the older and now rarely used technics, but these will lead the student through considerable historical data to his advantage.

An interesting feature is the complete index to all 3 volumes at the end of each volume. This makes it easy, for those using these books for reference purposes, to know where to find what they are after without going through the index to each volume.

Another surprise is the long chapter on the anatomy of the abdominal wall and incisions, which, strangely enough, appears at the end of the third volume.

The author has written a delightful preface and has dedicated his work to his great teachers of surgery at Johns Hopkins. He has been modest in his own attitude regarding his preference for procedures although he has included many recognized technics, extensively portrayed, which he obviously does not use.

This work should be made available in all reference medical libraries.

ARTHUR W. ALLEN, M.D.

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

Psychiatry and the Law: The proceedings of the forty-third annual meeting of the American Psychopathological Association, held in New York City, June, 1953. Edited by Paul H. Hoch, M.D., New York State Psychiatric Institute and Columbia University College of Physicians and Surgeons; and Joseph Zubin, Ph.D., New York State Psychiatric Institute, Department of Psychology, Columbia University. 8°, cloth, 232 pp. New York: Grune and Stratton, 1955. $5.50.

Cardiovascular Surgery. By Gerald H. Pratt, M.D., associate clinical professor of surgery, New York University College of Medicine, attending surgeon and chief of the Vascular Clinic, Saint Vincent's Hospital, City of New York, attending surgeon, St. Clare's Hospital, City of New York, and consultant to the United States Navy Hospitals, Meadow Brook Hospital, Long Island, and All Souls Hospital, Morristown, New Jersey. 8°, cloth, 843 pp., with 358 illustrations, 4 color plates, and 52 tables. Philadelphia: Lea and Febiger, 1954. $15.00.

Hearing Therapy for Children. By Alice Streng, M.A., director, Exceptional Division, Wisconsin State College, Milwaukee; Waring J. Fitch, M.A., hearing and vision consultant, Washington State Department of Health; LeRoy D. Hedgecock, Ph.D., consulting audiologist, Mayo Clinic; James W. Phillips, M.D., otolaryngologist, consultant, Washington State Department of Health, and lecturer, University of Washington; and James A. Carrell, Ph.D., director, Speech and Hearing Clinic, University of Washington. 8°, cloth, 371 pp., with illustrations and tables. New York: Grune and Stratton, Incorporated, 1955. $6.75.

The Genesis and Prevention of Cancer. By W. Sampson Handley, M.S. Lond., F.R.C.S., senior consulting surgeon to the Middlesex Hospital. Second edition. 8°, cloth, 320 pp., with 114 illustrations. New York: Macmillan Company, 1955. $4.00.

The Rural Hospital: Its structure and organization. By Dr. R. F. Bridgman, deputy director of health of the Department of the Seine, France, and chief inspector of health. 8°, paper, 162 pp., with 21 illustrations and 8 tables. Geneva: World Health Organization, 1955. $4.00. (No. 21, *World Health Organization Monograph Series.*)

Differential Diagnosis: The interpretation of clinical evidence. By A. McGehee Harvey, M.D., professor of medicine and head, Department of Internal Medicine, Johns Hopkins University School of Medicine, and physician-in-chief, Johns Hopkins Hospital; and James Bordley, III, M.D., director, Mary Imogene Bassett Hospital, Cooperstown, New York, clinical professor of medicine, Columbia University College of Physicians and Surgeons, and clinical professor of medicine, Albany Medical College. 8°, cloth, 665 pp. Philadelphia: W. B. Saunders Company, 1955. $11.00.

Doctor and Patient. By Desmond O'Neill, M.D., M.R.C.P. (Lond.), D.P.M. (Eng.), physician, Department of Psychiatry, St. Mary's Hospital, London, psychiatrist, Chelsea Hospital for Women, and clinical assistant, Department of Psychological Medicine, University College Hospital. 8°, 197 pp. Philadelphia: J. B. Lippincott Company, 1955. $5.00.

Investigations on Genetic Aspects of Carcinoma of the Stomach and Breast. By Charles M. Woolf. 8°, paper, 124 pp., with 23 tables and 5 illustrations. Berkeley: University of California Press, 1955. $1.00. *(University of California Publications in Public Health,* Volume 2, No. 4, pp. 265-350, 5 figures in text.)

Migraine and Periodic Headache: A modern approach to successful treatment. By Nevil Leyton, M.A. (Cantab.), M.R.C.S., L.R.C.P., clinical assistant, King Edward VII Hospital, Windsor. Second edition. 12°, cloth, 128 pp. London: William Heinemann Medical Books, Limited, 1954. $2.50. (Distributed by Charles C Thomas, Springfield, Illinois.)

Denial of Illness: Symbolic and physiological aspects. By Edwin A. Weinstein, M.D., associate attending neurologist, Mount Sinai Hospital, New York City, and consultant neuropsychiatrist, Army Medical Service Graduate School, Washington, D.C.; and Robert L. Kahn, Ph.D., research psychologist, Mount Sinai Hospital, New York City. 8°, cloth, 166 pp., with 4 illustrations and 2 tables. Springfield, Illinois: Charles C Thomas, 1955. $4.75. (Publication No. 249, *American Lecture Series.)*

The Mask of Sanity: An attempt to clarify some issues about the so-called psychopathic personality. By Hervey Cleckley, M.D., professor of psychiatry and neurology, Medical College of Georgia, Augusta, Georgia. Third edition. 8°, cloth, 596 pp. St. Louis: The C. V. Mosby Company, 1955. $9.50.

Good General Practice: A report of a survey. By Stephen Taylor, M.D., M.R.C.P. 8°, cloth, 604 pp., with 56 illustrations and 28 tables. New York: Oxford University Press, 1954. $3.50. (Nuffield Provincial Hospitals Trust.)

Arthritis and Rheumatism: The diseases and their treatment. By Charles LeRoy Steinberg, M.D., director of Arthritis Clinic and senior attending physician in medicine, Rochester General Hospital. With five contributors. 8°, cloth, 326 pp., with 124 illustrations, 10 colored plates, and 4 tables. New York: Springer Publishing Company, Incorporated, 1954. $10.00.

Quantitative Methods in Histology and Microscopic Histochemistry. By Olavi Eränkö, lecturer in microscopical anatomy, University of Helsinki, and assistant director of the Department of Physiology, Institute of Occupational Health, Työterveyslaitos, Helsinki. In statistical collaboration with Jaakko Kiglberg, head of the Section of Statistics, Institute of Occupational Health, Työterveyslaitos, Helsinki. 8°, cloth, 160 pp., with 49 illustrations. Boston: Little, Brown and Company, 1955. $5.50.

Manual of Hand Injuries. By H. Minor Nichols, M.D., clinical instructor in surgery, University of Oregon Medical School. With a foreword by Michael L. Mason, M.D. 8°, cloth, 352 pp., with 180 illustrations. Chicago: Year Book Publishers, Incorporated, 1955. $9.50.

A Textbook of Neurology. By H. Houston Merritt, M.D., professor of neurology, Columbia University College of Physicians and Surgeons, director of the Service of Neurology, Neurological Institute, Presbyterian Hospital, and consultant neurologist, Montefiore Hospital, New York City. 8°, cloth, 746 pp., with 181 illustrations and 128 tables. Philadelphia: Lea and Febiger, 1955. $12.50.

Should the Patient Know the Truth?: A response of physicians, nurses, clergymen, and lawyers. Edited by Samuel Standard, M.D., and Helmuth Nathan, M.D. 8°, cloth, 160 pp. New York: Springer Publishing Company, 1955. $3.00.

Psychopathology and Education of the Brain-Injured Child: Progress in theory and clinic. Vol. 2. By Alfred A. Strauss, president and director, Cove Schools for Brain-Injured Children, Racine, Wisconsin, and Evanston, Illinois; and Newell C. Kephart, professor of psychology, Purdue University, Lafayette, Indiana. In collaboration with Laura E. Lehtinen and Samuel Goldenberg. With drawings by Caspar Henselmann. 8°, cloth, 266 pp. New York: Grune and Stratton, 1955. $6.00.

Practitioners' Conferences Held at the New York Hospital — Cornell Medical Center. Vol. 1. Edited by Claude E. Forkner, M.D., professor of clinical medicine, Cornell University Medical College, and attending physician, New York Hospital. 8°, cloth, 411 pp., with 8 illustrations and 2 tables. New York: Appleton-Century-Crofts, Incorporated, 1955. $6.75.

Teaching Physiology and Anatomy in Nursing: Signposts for science teachers. By Hessel H. Flitter, R.N., M.A., assistant professor of nursing and consultant on curriculum and evaluation, School of Nursing, University of Pennsylvania; and Harold R. Rowe, R.N., M.S., assistant professor of nursing and advisor to the Hospital Contract Program (Central Science Teaching Service), School of Nursing, University of Pennsylvania. (With special reference to the textbook, *Physiology and Anatomy,* by Esther M. Greisheimer. Seventh edition. 8°, cloth, 56 pp. Philadelphia: J. B. Lippincott Company, 1955. $2.00.

The Practice of Dynamic Psychiatry. By Jules H. Masserman, M.D., professor of neurology and psychiatry, Northwestern University Medical School. 8°, cloth, 790 pp. Philadelphia: W. B. Saunders Company, 1955. $12.00.

Neurochemistry: The chemical dynamics of brain and nerve. Edited by K. A. C. Elliott, M.Sc., Ph.D., Sc.D., neurochemist and Donner Fellow, Montreal Neurological Institute, and associate professor of experimental neurology and biochemistry, McGill University, Montreal; Irvine H. Page, M.D., director of research, Cleveland Clinic, Cleveland, Ohio; and J. H. Quastel, D.Sc., Ph.D., A.R.C.S., F.R.I.C., F.R.S.C., F.R.S., F.C.I.C., director, Research Institute, Montreal General Hospital, and professor of biochemistry, McGill University, Montreal. 8°, cloth, 900 pp., with illustrations and tables. Springfield, Illinois: Charles C Thomas, 1955. $19.50.

Pathology for the Surgeon. By William Boyd, M.D. (Edin.), F.R.C.S. (Canada), F.R.C.P. (Lond.), M.R.C.P. (Edin.), F.R.S. (Canada), LL.D. (Sask.), D.Sc. (Man.), M.D. (Oslo), lecturer on the humanities in medicine, University of Toronto, and visiting professor of pathology, University of Alabama. Seventh edition. 4°, cloth, 737 pp., with 547 illustrations including 10 in color. Philadelphia: W. B. Saunders Company, 1955. $12.50.

A Textbook of Medicine. Edited by Russell L. Cecil, M.D., Sc.D., and Robert F. Loeb, M.D., Sc.D., LL.D., Bard Professor of Medicine, Columbia University College of Physicians and Surgeons. Associate editors, Alexander B. Gutman, M.D., Ph.D., professor of medicine, Columbia University College of Physicians and Surgeons; Walsh McDermott, M.D., Livingston Farrand Professor of Public Health and Preventive Medicine, Cornell University Medical College; and Harold G. Wolff, M.D., professor of medicine (neurology), Cornell University Medical College. Ninth edition. 4°, cloth, 1786 pp., with 200 illustrations. Philadelphia: W. B. Saunders Company, 1955. $15.00.

Blood Supply and Anatomy of the Upper Abdominal Organs: With a descriptive atlas. By Nicholas A. Michels, M.A., D.Sc. (Louvain), professor of anatomy at the Daniel Baugh Institute of Anatomy, Jefferson Medical College, Philadelphia. 4°, cloth, 581 pp., with 172 illustrations, including 166 in color. Philadelphia: J. B. Lippincott Company, 1955. $24.00.

Intestinal Obstructions: Physiological, pathological and clinical considerations with emphasis on therapy, including description of operative procedures. By Owen H. Wangensteen, M.D., Ph.D., professor of surgery, University of Minnesota Medical School. Third edition. 4°, cloth, 838 pp., with 200 illustrations and 66 tables. Springfield, Illinois: Charles C Thomas, 1955. $15.50.

Surgical Forum: Proceedings of the forum sessions, Fortieth Clinical Congress of the American College of Surgeons, Atlantic City, New Jersey, November, 1954. Vol. 5. By Harris B. Shumacker, Jr., M.D., chairman, Committee on Forum on Fundamental Surgical Problems, and others. 8°, cloth, 851 pp., with illustrations and tables. Philadelphia: W. B. Saunders Company, 1955. $10.00.

Problems of Consciousness: Transactions of the Fifth Conference, March 22, 23, and 24, 1954, Princeton, New Jersey. Edited by Harold A. Abramson, M.D., assistant clinical professor of physiology, Columbia University College of Physicians and Surgeons, and associate attending physician for allergy, Mount Sinai Hospital, New York City. 8°, cloth, 180 pp., with 10 illustrations. New York: Josiah Macy, Jr., Foundation, 1955. $3.50. *(Josiah Macy, Jr., Foundation Publications, Conference Transactions, April, 1955.)*

NONCLINICAL NOTES

ST. ELIZABETH'S HOSPITAL

The Joseph Stanton Memorial Research Laboratories were recently opened at St. Elizabeth's Hospital, Boston, with extensive facilities for experimental and clinical research.

The laboratories, costing $500,000, will supervise directly research in the field of blood. Dr. Mario Stefanini has been appointed director, and Dr. Robert Spellman will supervise surgical research.

There will be facilities for research for members of the visiting and resident staff and to medical students from Tufts University School of Medicine.

EASTERN PSYCHIATRIC RESEARCH ASSOCIATION

The officers of the Eastern Psychiatric Research Association, a newly organized association of psychiatrists chartered in New York State, are as follows: president, Dr. David Impastato, New York City; vice-president, Dr. Leo Alexander, Boston; and secretary-treasurer, Dr. Theodore R. Robie, East Orange, New Jersey.

NOTICES

ANNOUNCEMENTS

Dr. Myron H. Matz announces the opening of his office for the practice of diseases of the skin at 51 Brattle Street, Harvard Square, Cambridge, Massachusetts.

Dr. Philip Mysel announces the removal of his office to 351 Commonwealth Avenue, Boston 15, Massachusetts.

FORUM ON REHABILITATION

A forum on "Rehabilitation: A comprehensive Program," will be sponsored by Harvard School of Public Health in the Auditorium, Jimmy Fund Building, on Tuesday, March 6, at 4 p.m.

Among the speakers will be Miss Mary E. Switzer, director of the Office of Vocational Rehabilitation, Department of Health, Education and Welfare; Dr. Hugh Leavell will preside.

AMERICAN COLLEGE OF ALLERGISTS

The Graduate Instructional Course of the American College of Allergists will be held at the Hotel New Yorker, New York City, April 15-17. After the course, the Twelfth Annual Meeting will be held at the same hotel April 18-20.

AMERICAN ACADEMY OF PEDIATRICS

The spring session of the American Academy of Pediatrics will be held at the Sam Houston Coliseum, Houston, Texas, April 16-18. The general sessions and exhibits will last from Monday morning through Wednesday noon. Clinics will be held in Houston at the various hospitals of the Texas Medical Center and Baylor University College of Medicine and in Galveston at the University of Texas School of Medicine on Wednesday afternoon and Thursday, April 19. After the spring session there will be a special clinical meeting at the Hospital Infantil, Mexico City, Mexico, on April 21. A special tour has been arranged for those attending.

Reservations for the spring session, clinical meeting and tours should be made in advance. Further information may be obtained from Dr. E. H. Christopher, Executive Secretary, American Academy of Pediatrics, 1801 Hinman Avenue, Evanston, Illinois.

INTERNATIONAL ACADEMY OF PROCTOLOGY

The eighth annual convention of the International Academy of Proctology will be held at the Drake Hotel, Chicago, April 23-26. The program will consist of papers, panel, symposium and motion pictures covering major developments in proctology.

Dr. Alfred L. Solow, of Boston, will present a paper entitled "Lipoma Simulating Polyp of the Descending Colon," and Dr. Edward T. Whitney, also of Boston, will participate in a panel on the subject "Diseases of the Anus and Rectum."

Further information may be obtained from Dr. Alfred J. Cantor, Secretary, International Academy of Proctology, 147-41 Sanford Avenue, Flushing 55, New York.

THIRD MICROCIRCULATORY CONFERENCE AND AMERICAN ASSOCIATION OF ANATOMISTS

The Third Microcirculatory Conference for Physiology and Pathology, which was announced in the January 19 issue of the *Journal*, will be in conjunction with a meeting of the American Association of Anatomists. All sessions will be held at the Hotel Schroeder, Milwaukee, Wisconsin, on April 3.

JOSIAH MACY, JR., FOUNDATION LECTURES

The Department of Obstetrics, Harvard Medical School, announces that two lectures sponsored by the Josiah Macy, Jr., Foundation, will be given in the auditorium of the Boston Lying-in Hospital on Monday, March 19, at 4 p.m., and on Wednesday, March 21, at 4 p.m.

Both lectures will be presented by Dr. Robert Caldeyro-Barcia, professor of obstetric physiology and head, Section of Obstetrical Physiology of the University of Uruguay School of Medicine. The first lecture will be on the subject "Normal Uterine Action in Labor Studied by the Record of Intra-amniotic and Intra-myometrial Pressures." The subject of the second lecture will be "Abnormal Uterine Action and Consequences on the Progress of Labor and Fetal Oxygenation."

All physicians and medical students are invited.

EASTERN PSYCHIATRIC RESEARCH ASSOCIATION

The Eastern Psychiatric Research Association will hold four meetings a year, including the annual meeting in October, when a prize will be awarded for the best presentation of a scientific report.

Further information may be obtained from Dr. Theodore R. Robie, Secretary-Treasurer, Eastern Psychiatric Research Association, 676 Park Avenue, East Orange, New Jersey.

Official transactions will be published in *Diseases of the Nervous System.*

SOCIETY MEETINGS AND CONFERENCES

FEBRUARY 27. Benjamin Waterhouse Medical History Society. Page 241, issue of February 2.
FEBRUARY 27. Boston University School of Medicine, Harvard Medical School and Tufts University School of Medicine. Page 347, issue of February 16.
FEBRUARY 28, MARCH 6, 13, 20, 27 and APRIL 3. Boston City Hospital House Officers' Association. Page 297, issue of February 9.
FEBRUARY 29. Massachusetts Heart Association. Page 347, issue of February 16.
FEBRUARY 29, MARCH 21 and APRIL 25. Massachusetts Heart Association. Page 623, issue of October 6.
MARCH 1. New England Diabetes Association. Page 346, issue of February 16.
MARCH 4–8. College of Medical Evangelists Postgraduate Convention. Page 347, issue of February 16.
MARCH 5 and APRIL 2. Fried Lecture Series. Page 535, issue of September 22.
MARCH 5, 19, APRIL 2 and 16. Hartford Medical Society. Page 242, issue of February 2.
MARCH 6. Phi Delta Epsilon Fraternity Graduate Program. Page 347, issue of February 16.
MARCH 6. Forum on Rehabilitation. Page 399.
MARCH 7. Massachusetts General Hospital. Page 347, issue of February 16.
MARCH 15–17. American Orthopsychiatric Association. Page 86, issue of January 12.
MARCH 18. Yale University School of Medicine. Page 347, issue of February 16.
MARCH 19–21. Josiah Macy, Jr., Foundation Lectures. Notice above.
MARCH 19–22. American Academy of General Practice. Page 1092, issue of December 15.
MARCH 19–28 and JUNE 4–13. Army Medical Service Postgraduate Course. Page 84, issue of July 14.
MARCH 21. New England Pediatric Society. Page 347, issue of February 16.
MARCH 21, 22 and 23. Medical and Dental Symposium. Page 348, issue of February 16.
MARCH 21 and APRIL 26. Phi Delta Epsilon Fraternity Graduate Club Program. Page 118, issue of July 21.
MARCH 28 and APRIL 18. Greater Boston Medical Society. Page 208, issue of August 4.
MARCH 24 and 25. American Psychosomatic Society. Page 260, issue of August 11.
APRIL 3. Third Microcirculatory Conference. Page 399.
APRIL 4. New England Surgical Society. Page 347, issue of February 16.
APRIL 15–17. American College of Allergists. Page 399.
APRIL 16–18. American Academy of Pediatrics. Page 399.
APRIL 23–26. International Academy of Proctology. Page 399.
MAY 2. Postgraduate Medical Institute. Page 487, issue of September 15.
MAY 3–5. American Goiter Association. Page 348, issue of August 25.
MAY 28–JUNE 1. European Symposium on Vitamin B. Page 578, issue of September 29.
JUNE 21–23. Society of Nuclear Medicine. Page 1092, issue of December 15.
JUNE 21–24. American Academy of Dental Medicine. Page 994, issue of December 1.
AUGUST 19–23. American College of Chest Physicians. Page 840, issue of November 10.
SEPTEMBER 3–5. Congress on Blood Transfusion, Blood Banks and Hematology. Page 297, issue of February 9.
SEPTEMBER 10–14. American Dietetic Association. Page 1180, issue of December 29.

CALENDAR FOR THE WEEK BEGINNING THURSDAY, MARCH 1

THURSDAY, MARCH 1
*8:00–8:45 a.m. Case Presentations. Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*8:00–9:00 a.m. Surgical Grand Rounds. Dr. John Spellman and staff. Saint Elizabeth's Hospital.
*8:45–9:45 a.m. Cardiac Grand Rounds. Jimmy Fund Building, Children's Medical Center, 35 Binney Street.
*9:00–10:00 a.m. Surgical Rounds. Sherman Auditorium, Beth Israel Hospital.
*9:00–10:00 a.m. Arthritis Grand Rounds. Robert Breck Brigham Hospital.
*10:00–11:00 a.m. Combined Medical-Surgical Rounds. Sherman Auditorium, Beth Israel Hospital.
10:30–11:15 a.m. Lecture on Diabetes for Doctors and Patients by a Member of the Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*11:00 a.m.–12:00 m. Medical Grand Rounds. Dr. Sylvester McGinn and staff. Saint Elizabeth's Hospital.
*11:00 a.m.–12:00 m. Medical Staff Conference. Sherman Auditorium, Beth Israel Hospital.
*11:00 a.m.–12:30 p.m. Hand Clinic (Physical Medicine and Rehabilitation Service). Boston City Hospital.
*11:15 a.m. Thoracic Conference. The Embryologic Basis of Congenital Heart Defects. Dr. Dwight E. Harken. Main Amphitheater, Peter Bent Brigham Hospital.
*12:00 m. Clinicopathological Conference. Dr. Benjamin Castleman and associates. Pathology Amphitheater, Massachusetts General Hospital.
*12:00 m.–1:00 p.m. Staff Conference. Stearns Auditorium, New England Center Hospital.
*12:00 m.–1:00 p.m. Surgical Staff Conference. Sherman Auditorium, Beth Israel Hospital.
*12:15–1:15 p.m. Tumor Clinic. Dr. T. W. Botsford. Amphitheater, Peter Bent Brigham Hospital.
*8:00 p.m. New England Diabetes Association. Current Research in Diabetes and Carbohydrate Metabolism. Jimmy Fund Building, Children's Medical Center, 35 Binney Street.

FRIDAY, MARCH 2
*8:00–8:45 a.m. Case Presentations. Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*8:00–9:00 a.m. Members and Guests of the Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*9:30–11:30 a.m. Medical and Surgical Grand Rounds. Drs. George W. Thorn and Francis D. Moore. Main Amphitheater, Peter Bent Brigham Hospital.
*10:00 a.m. Tuberculosis Surgical Clinic. South End Health Unit, 57 East Concord Street.
10:30–11:15 a.m. Lecture on Diabetes for Doctors and Patients by a Member of the Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*12:00 m. Pediatric Grand Rounds. Thorndike Amphitheater, Boston City Hospital.
*1:00–3:00 p.m. Combined Medical-Surgical Grand Rounds. Stearns Auditorium, New England Center Hospital.
*1:30 p.m. Fertility and Endocrine Clinic. Free Hospital for Women, Brookline.
*1:30 p.m. Tumor Clinic. Mount Auburn Hospital, Cambridge.
*2:00–3:00 p.m. Pathology Conference. Dr. James Graham. Saint Elizabeth's Hospital.
*4:00–10:00 p.m. Alcoholism Clinic. By appointment. Washingtonian Hospital, 41 Morton Street, Jamaica Plain.
*4:30 p.m. Neuroradiologic Conference. X-Ray Conference Room, New England Deaconess Hospital.

SATURDAY, MARCH 3
*8:00–8:45 a.m. Case Presentations. Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*8:00–9:30 a.m. Anesthesia Conference. Dr. Benjamin Etsten. Pratt Lecture Hall, Joseph H. Pratt Diagnostic Hospital.
*8:30–10:00 a.m. Orthopedic Staff Conference. Boston City Hospital.
*8:30–10:00 a.m. Surgical Grand Rounds. Drs. Charles G. Child, III, A. J. A. Campbell and staff. First (Tufts) Surgical Service, New Cheever Amphitheater, Dowling Building, Boston City Hospital.
*10:30 a.m. Teaching Ward Rounds. Ward South 2, Free Hospital for Women.
10:30–11:15 a.m. Lecture on Diabetes for Doctors and Patients by a Member of the Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*11:00 a.m.–12:00 m. Hematology Conference (Blood Clinic). Dr. William Dameshek. Stearns Auditorium, New England Center Hospital.

MONDAY, MARCH 5
*8:00–8:45 a.m. Case Presentations. Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*8:00–9:00 a.m. Medical and Surgical Clinic on Diabetic Problems. New England Deaconess Hospital.
*8:30–9:30 a.m. Clinic by Entire Surgical Staff and Anesthesia Staff. New Cheever Amphitheater, Dowling Building, Boston City Hospital.
10:30–11:15 a.m. Lecture on Diabetes for Doctors and Patients by a Member of the Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*11:00 a.m.–12:30 p.m. Staff Conference. Child Psychiatry. By appointment. Conference Room (Burnham 7), Massachusetts General Hospital.
*12:00 m.–1:00 p.m. Pediatric Clinicopathological Conference. Pratt Lecture Hall, Joseph H. Pratt Diagnostic Hospital.
*12:00 m.–1:00 p.m. Metabolism Conference. Dr. William Schwartz. Stearns Auditorium, New England Center Hospital.

(Concluded on page xx)